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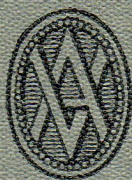


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**VICKERS-ARMSTRONGS  
LIMITED**



**HANDBOOK  
OF THE  
VICKERS  
AIRCRAFT OBSERVER'S  
MACHINE GUN  
(Class "F"—Rifle Calibre)**



HANDBOOK  
OF THE  
VICKERS AIRCRAFT  
OBSERVER'S MACHINE GUN  
(Class "F"—Rifle Calibre).



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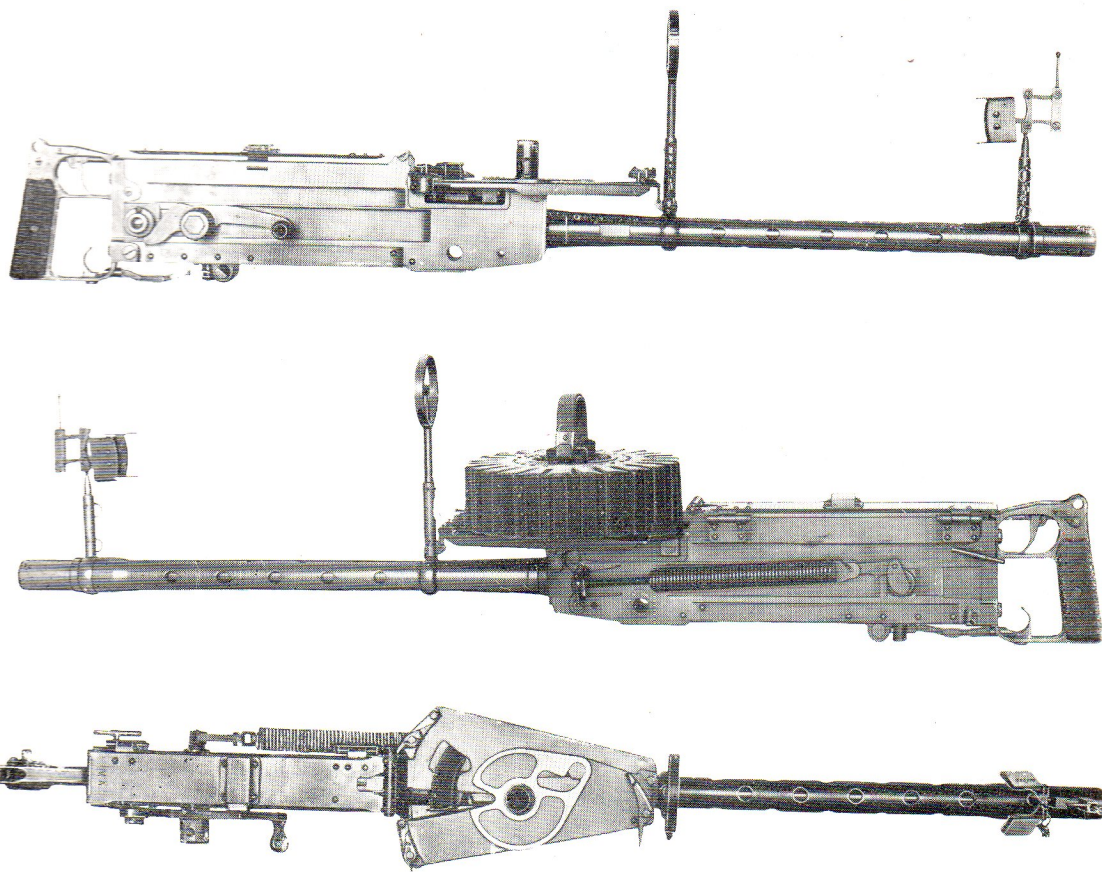
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Vickers Aircraft Observer's Machine Gun  
(Class "F"—Rifle Calibre).



# HANDBOOK

## OF THE

### VICKERS AIRCRAFT

### OBSERVER'S MACHINE GUN

(Class "F"—Rifle Calibre).

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# VICKERS AIRCRAFT OBSERVER'S MACHINE GUN (Class " F "—Rifle Calibre).

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## GENERAL DATA

---

Length of Barrel	..	..	..	..	24 in.	..	609.6 m/m
Recoil	..	..	..	..	Approx. 1 in.	..	25.4 m/m
Rounds per minute	..	..	..	..	700-750		
Weight of the Gun complete (with empty Magazine and Vane Sights)	..	..	..	..	28.75 lbs.	..	13 kg.
Weight of the Magazine (empty)	..	..	..	..	3.75 lbs.	..	1.7 kg.
Weight of the Magazine (full)	..	..	..	..	8.9 lbs.	..	4 kg.
Capacity of the Magazine	..	..	..	..	97 Rounds		
Length of the Gun (overall)	..	..	..	..	40.25 in.	..	1,022.3 m/m

# VICKERS AIRCRAFT OBSERVER'S MACHINE GUN

(Class " F "—Rifle Calibre).

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## SPECIAL FEATURES

The Vickers Aircraft Observer's Machine Gun (Class " F "—Rifle Calibre) is an air-cooled Gun, supplied with ammunition from a drum-shaped magazine, of which, the capacity is 97 rounds. This magazine is attached to the top of the Gun and can easily be removed from it.

The Gun and ammunition being self-contained, this weapon forms a highly efficient arm for use in the rear cockpit of an aircraft, where it is essential that the Gun shall be capable of being easily manœuvred.

Except for the magazine feed, the action of this Gun is the same as that of the standard Vickers R.C. Gun ; in fact, the recoiling parts, with the exception of the Barrel, Connecting Link and Return Spring, are exactly the same as those of the Vickers Belt-fed Aircraft Pilot's Gun (Class " E ").

An important feature is that, by the interchange of a few parts, the Gun may be converted to a Belt-fed weapon and used by the pilot for synchronised fire between the blades of the air screw.

The advantages of having both fixed and free guns of the same system on an aircraft, the majority of the component parts of which are the same, are that fewer "spares" and tools are necessary and instruction in the working and maintenance of the gun is simplified.

*Note.*—Since this Gun is air cooled, it must be fired only in short bursts (not exceeding 100 rounds) on the ground, time being allowed between the bursts for cooling.



## GENERAL DESCRIPTION OF THE GUN

The Gun consists of three main parts :—

- (1) The Non-Recoiling Parts ;
- (2) The Feed Mechanism (which may be classified with the Non-Recoiling Parts) ;
- (3) The Recoiling Parts.

It is operated automatically by two forces :—

- (a) The explosion of the charge, which forces the Recoiling Parts backwards ;
- (b) A strong spiral Spring (called the Fuzee Spring), which carries the Recoiling Parts forward.

### THE NON-RECOILING PARTS

The Non-Recoiling Parts consist of the Breech Casing with those parts attached thereto, the Feed Mechanism and the Jacket.

### Breech Casing.

The Breech Casing consists of two outside Side Plates (80 and 88) riveted to the Trunnion Block (93) at the front end and cross connected at the rear end by the Back Block (55) and the Bottom Plate (92). The Side Plates are held rigidly at the top by the Rear Cover.

#### Side Plates. (*See Plate 8, Page 52*)

The Side Plates (80 and 88) consist of two flat steel plates which are cut out at the front end to receive the Feed Block (41) and have slots cut in the rear end in which the crank bearings slide. They have holes drilled in the front end, near the top, for the Front-Cover-Plate Catch Pin (78a) and in the front end, near the bottom, for the trunnion pin and securing pin for ammunition bag. Holes are drilled at the rear end for the Back-Block Hinge Pin (57) and the Fixing Pin (58). A rectangular hole is cut near the top of the right-hand Side Plate for the Rear-Cover Catch (68). Rivet holes are drilled for the Trunnion Block, Bottom Plate and side cams. The plates are undercut on the outsides, wherever possible, for lightness. There are projecting pieces on the rear ends which engage in slots cut in the Back Block.

### **Trunnion Block.** (*See Plate 8, Page 52*)

The Trunnion Block (93) is a steel block which is bored out to form a bearing for the breech end of the Barrel (40). It is bored and screwed at the front end to receive the rear end of the Barrel. It has two extensions projecting vertically downwards, in which rivet holes are drilled for connecting to the Side Plates (80 and 88), and two horizontal flanges on which the Side Plates rest. Two holes are drilled, near the bottom, for the trunnion pin and securing pin for ammunition bag and a hole is drilled, near the top front end, for the Front-Cover-Plate Catch Pin (78a). It is bevelled on top left hand side to clear the Connecting Link (137) and on the top right hand side for lightness.

### **Side Cams.** (*See Plate 8, Page 52*)

Side Cams (82 and 90) are riveted to the inside of the Side Plates (80 and 88). These Cams serve as guides on which the horns of the Extractor (16) run. A step is cut in the rear of these Cams to hold the horns of the Extractor (16) and prevent the live cartridge, carried by the Extractor (16), from running forward again into the cartridge in the Feed Block (41).

### **Back Block.** (*See Plates 6 and 8, Pages 50 and 52*)

The Back Block (55) is channel shaped and the side flanges are grooved to take the ends of the Side Plates (80 and 88), while two rectangular holes are cut in the back web to receive a projection on the end of the Side Plates (80 and 88). The side flanges are drilled for the Hinge Pin (57) and Fixing Pin (58) and a groove is cut in the top of the back web to admit the Actuating Bar (61). Two holes are drilled in the back web for securing the Grip Frame (56).

### **Grip Frame.** (*See Plates 6 and 8, Pages 50 and 52*)

The Grip Frame (56) is of steel, is of very light construction and is fitted with wood Grips (56a). It carries the Actuating Bar (61), the Trigger (59), Safety Catch (64), and the Hand-Loading Trigger (110). Two holes are drilled in the front end for securing it to the Back Block (55).

## Trigger, Actuating Bar and Safety Catch.

(See Plate 6, Page 50)

The Trigger (59) is of the ordinary finger grip type. At the top it is drilled for the Axis Pin (60) and slotted to take the Actuating Bar (61). The Axis Pin is secured by a Catch (60a).

The Actuating Bar (61) has a hook at the front end for engaging with the rear end of the Trigger Bar (74). It is cut away in the middle to take the Trigger (59) and has a hardened projection on the underside for engaging with the Trigger (59). It is held in the normal position, forward, by a Spring (66).

The Safety Catch (64) is provided with a Dimple Pin and a Safety-Catch Axis Pin (65). The Axis Pin (65) is an interrupted Pin.

When the Safety Catch is in the bottom position, it is impossible to fire the Gun.

## Bottom Plate. (See Plate 8, Page 52).

The Bottom Plate (92) is channel shaped. It has a boss on the underside, which is drilled to take the Loading Plunger (100). A hole is drilled in the bottom web to take the Bell-Crank Axis Pin (104) and another to take the stud for the Bell-Crank Spring (108). The vertical flanges are drilled for riveting to the Side Plates.

## Hand-Loading Device. (See Plates 6 and 8, Pages 50 and 52).

A Hand-Loading Device is fitted to the Bottom Plate (92) and Grip Frame (56) for initial loading. It consists of the following parts :—

- (1) Loading Plunger (100).
- (2) Loading-Plunger Spring (101).
- (3) Loading-Plunger Piston (102).
- (4) Loading-Plunger Bell Crank (103).
- (5) Loading-Plunger Bell-Crank Axis Pin and Nut (104 and 105).
- (6) Loading-Plunger Bell-Crank Link (106).
- (7) Loading-Plunger Bell-Crank-Link Screw (107).
- (8) Loading-Plunger Bell-Crank-Spring (108).
- (9) Loading-Plunger Bell-Crank-Spring Stud (109).
- (10) Loading-Plunger Trigger (110).
- (11) Loading-Plunger-Trigger Guide Pin (111).
- (12) Loading-Plunger Chain Links (112).



The Plunger is designed to act independently of the Bell Crank and Trigger, so that, even if the Trigger is held back, the Plunger can still be forced inwards to allow the toe of the Crank Handle to pass.

**Rear Cover.** (*See Plate 8, Page 52*)

The Rear Cover (67) is of the side-opening pattern. It is hinged at the left-hand side of the Gun by the Hinges (67a and 67b) and the Hinge Pin (67c). On the underside of the Cover, and projecting downwards, two Extractor Guides (72) are riveted and these, together with the Side Cams (82 and 90) on the Side Plates (80 and 88) control the path of the Extractor (16) during recoil. A groove is cut on the underside to receive the Trigger Bar (74) and a hole is drilled in the rear end to receive the Trigger-Bar Spring (75). A recess is also provided on the underside in which the top of the Lock Frame (1) slides.

**Rear-Cover Catch.** (*See Plate 8, Page 52*)

A Catch is provided on top of the rear Cover for locking it in position. This consists of a Cover-Catch Bracket (70b), a Cover Catch (68) and a Cover-Catch Spring (70).

The Cover-Catch Bracket (70b) is channel shaped with a closed end and is riveted to the top of the Cover. A pin hole is drilled for securing the Catch (68).

The Cover Catch (68) slides in the Bracket (70b). It has a projection downwards with a lip for clipping the right-hand Side Plate (80) and is drilled to receive the Spring (70). An elongated hole is cut for securing to the Bracket (70b) and this allows the necessary locking and unlocking movement. The Spring (70) holds the Catch (68) in the locked position.

**Filling-in Pieces.** (*See Plates 4 and 8, Pages 48 and 52*)

Filling-in Pieces (81 and 89) are provided to partly fill in the slots cut in the Side Plates for the crank bearing. The right-hand Filling-in Piece (81) is provided with a stud on which is a Roller (83) secured there by a Collar (84) and Securing Pin (84a). This Roller is in constant contact with the Crank Handle (29) and so the Filling-in Piece (81) is always held against the Back Block (55). The left-hand Filling-in Piece (89) is a flat plate and is dovetailed into the left-hand Side Plate (88) in such a way that it is fixed between the Side Plate and the Back Block.

### **Fuzee-Spring Bracket.** (*See Plates 4 and 8, Pages 48 and 52*)

The Fuzee-Spring Bracket (91) is a steel pressing with two hooks which clip on to two studs with collars secured to the left-hand Side Plate. It is drilled for the Tension Screw (35).

### **Fuzee-Spring Tension Screw.** (*See Plate 4, Page 48*)

A Tension Screw (35) is provided to adjust the initial tension on the Fuzee Spring (34). It is screwed into the Nut (34b) which latter is screwed into the front end of the Fuzee Spring (34). Its head bears against the front end of the Fuzee-Spring Bracket and is provided with a Vice Handle (35a) for turning.

### **Front-Cover Plate.** (*See Plates 5 and 8, Pages 49 and 52*)

The Front-Cover Plate (77) is a thin plate made of saw-blade steel with a stiffening angle riveted to each side. A pivot hole is drilled to receive the Cover-Plate Catch (78) which is riveted to the Plate (77). A slot is cut in the front part in which the Connecting Link (137) slides and a hole is drilled at the front end of this slot to pass the boss on the Connecting Link. A slot is cut at the rear end through which the cartridges pass and it is slotted transversely to accommodate the Cartridge Spring (48). Rivet holes are drilled at the rear end for securing the Front-Cover-Plate Hinge (53), at the rear left hand for securing the Retaining-Pawl Bracket (138), at the rear end for securing the Cartridge Guide (47), and at the front end for securing the Front Guide (132).

### **Front Cover-Plate Hinge and Pin.** (*See Plate 8, Page 52*)

The Front-Cover-Plate Hinge (53) is riveted to the Cover Plate (77). It is drilled for the Axis Pin (73) and is hinged to the Side Plates (80 and 88) by Axis Pin (73), Nut (73a) and Pin 73b). Two projecting pieces are provided at the bottom rear for engaging in grooves in the Side Plates (80 and 88). A radial groove is cut in the bottom underside to clear the Cartridge Retainer (43).

### **Front Cover-Plate Catch and Pin.** (*See Plate 8, Page 52*)

The Cover-Plate Catch (78) is riveted to the Front-Cover Plate (77). It has two projections on the bottom in which half holes are cut to receive the Front-Cover Catch Pin (78a). It is turned and screwed at the top to pass through the Front-Cover Plate (77) and receive the Magazine Post (79), and a pin hole is drilled for securing the Magazine Post.

The Front-Cover-Plate Catch Pin (78a) is an interrupted Pin screwed at one end to receive the Cap (78c) and a collar at the other end. It is held in the normal locked position by the Spring (78b).

**Cartridge Guide and Spring.** (*See Plates 5 and 8, Pages 49 and 52*)

The Cartridge Guide (47) is made of steel and is riveted to the Front-Cover Plate (77), over the opening for the cartridge. It has a ramp for guiding the Cartridges into position and is fitted with a Spring (48) for forcing the cartridges down into the Feed Block (41).

**Front Guide.** (*See Plate 8, Page 52*)

The Front Guide (132) is a flat plate riveted to the front end of the Front-Cover Plate (77) by two rivets. It has a projection downwards in which is cut a keyway to fit over the cover-plate support attached to the Back-Sight Securing Ring (153a) and which supports and locates the front end of the Front-Cover Plate (77). It has a spigot, solid with it, for receiving the Stop Pawl (133) and a half-round stop which engages with a recess in the Stop Pawl to prevent the latter from going too far over. A hole is drilled to receive the Spring Peg (139). It is undercut at the bottom rear end to provide a groove for the front end of the Feed Plate (135).

**Retaining-Pawl Bracket.** (*See Plate 8, Page 52*)

The Retaining-Pawl Bracket (138) is a flat steel plate riveted to the Front-Cover Plate (77) by two rivets. It has a Spigot, solid with it, for receiving the Retaining Pawl (134) and a half round stop, also solid with it, which engages with a recess in the Retaining Pawl to prevent the latter from going too far over. A hole is drilled to receive the Spring Peg (139).

**Retaining Pawl.** (*See Plate 8, Page 52*)

The Retaining Pawl (134) has a pointed end for engaging with the magazine and a thumb press on the other end. It has a recess milled in the underside for engaging with the projection on the Retaining-Pawl Bracket (138) and a hole is drilled to fit the spigot on this Bracket. It is trepanned and grooved on the underside to take the Pawl Spring (140). Its function is to retain the drum when the Actuating Pawl is being moved anti-clockwise on the recoil movement of the gun.



### **Retaining-Pawl Spring and Peg.** (*See Plate 8, Page 52*)

The Retaining-Pawl Spring (140) is made of small round spring steel wire. It is looped at one end to take the spigot trepanned on the Retaining Pawl (134) and is bent round to take the groove in this Pawl, while the other end is bent round to take the Spring Peg (139).

The Spring Peg (139) has a groove cut round the top to take the Pawl Spring (140) and is riveted to the Retaining-Pawl Bracket (138) and the Cover Plate (77).

This Retaining-Pawl Spring and Peg are identical with the Stop-Pawl Spring and Peg and the Actuating-Pawl Spring and Peg.

### **Stop Pawl.** (*See Plate 8, Page 52*)

The Stop Pawl (133) has a pointed end for engaging with the magazine and a thumb press on the other end. It has a recess milled in the underside for engaging with the projection on the Front Guide (132) and a hole is drilled to fit the spigot on this guide. It is trepanned and grooved on the underside to take the Pawl Spring (140). Its function is to stop the Magazine in the correct position when the Feed Pawl is being moved round clockwise on the forward movement.

### **Stop Pawl Spring and Peg.** (*See Plate 8, Page 52*)

The Stop-Pawl Spring (140) is made of small round spring steel wire. It is looped at one end to take the spigot trepanned on the Stop Pawl (133) and is bent round to take the groove in this Pawl, while the other end is bent round to take the Spring Peg (139).

The Spring Peg (139) has a groove cut round the top to take the Pawl Spring (140) and is riveted to the Front Guide (132) and the Cover Plate (77).

## The Feed Mechanism.

The Feed Mechanism is of the magazine or drum type and is provided with a special Feed Block.

It consists of the following parts :—

Feed Block (131), Feed Plate (135), Actuating-Pawl Bracket (138), Actuating Pawl (134), Actuating-Pawl Spring (140), Actuating-Pawl-Spring Peg (139), Pin Actuating the Stop Pawl (131), Magazine Post (79), Feed Pawl (136), Cartridge Spring (48), Cartridge Retainer (43), Cartridge-Retainer Spring (44), Cartridge-Retainer Securing Screw (45), Connecting Link (137) [Recoiling Part], Return Spring (137a) [Recoiling Part], Magazine, or Drum (complete).

### **Feed Block.** (*See Plates 5 and 8, Pages 49 and 52*)

The Feed Block (131) is made of steel and is cut out of a solid block. It has flanges on each side which fit over the Side Plates (80 and 88) and hold them together at the top. A recess is cut longitudinally to receive the cartridge and a groove is cut in the front end to clear the projection on the Connecting Link (137). Grooves are cut in the rear end to accommodate the Extractor (16). It is milled out transversely to admit the Feed Pawl (136) and is slightly bevelled off in the middle to clear the Cartridge Spring (48). There is a boss on the left side, at the rear, and the Block is drilled and screwed to receive the Cartridge Retainer (43), Spring (44) and Securing Screw (45).

### **Feed Plate.** (*See Plates 5 and 8, Pages 49 and 52*)

The Feed Plate (135) is a flat steel plate milled out, top and bottom, wherever practicable, for lightness. It has a hole drilled in the centre to fit the collar on the bottom of the Magazine Post (79) and a cam groove is milled out to take the pin on the Connecting Link (137). A hole is drilled in the front right-hand corner to take the Pin (131) for actuating the Stop Pawl (133). In the rear right-hand corner a hole is drilled to take the spigot on the Feed Pawl (136) and another to take the Spring Peg (139), while two rivet holes are drilled for riveting up the Feed Pawl (136) and the Actuating-Pawl Bracket (138) to the Feed Plate. A recess is cut in the centre part to clear the cartridge and the inside edge of the rear part is bevelled off to facilitate the feed.

### **Actuating-Pawl Bracket.** (*See Plate 8, Page 52*)

The Actuating-Pawl Bracket (138) is a flat steel plate riveted to the Feed Plate (135) by two rivets. It has a spigot solid with it for receiving the Actuating Pawl (134) and a half-round stop, also solid with it, which engages with a recess in the Actuating Pawl to prevent the latter from going too far over. A hole is drilled to receive the Spring Peg (139).

This Bracket is the same as the Retaining-Pawl Bracket described on Page 7.

### **Actuating Pawl.** (*See Plate 8, Page 52*)

The Actuating Pawl (134) has a pointed end for engaging with the magazine and a thumb press on the other end. It has a recess milled on the underside for engaging with the projection on the Actuating-Pawl Bracket (138) and a hole is drilled to fit the spigot on this Bracket. It is trepanned and grooved on the underside to take the Pawl Spring (140). Its function is to turn the magazine clockwise during the forward movement of the Gun to feed in the cartridges.

This Pawl is the same as the Retaining Pawl described on page 7.

### **Actuating-Pawl Spring and Peg.** (*See Plate 8, Page 52*)

The Actuating-Pawl Spring (140) is made of small round spring steel wire. It is looped at one end to take the spigot trepanned on the Actuating Pawl (134) and is bent round to take the groove in this Pawl, while the other end is bent round to take the Spring Peg (139).

The Spring Peg (139) has a groove cut round the top to take the Pawl Spring (140) and is riveted to the Actuating Pawl Bracket (138) and the Feed Pawl (136).

### **Pin Actuating the Stop Pawl.** (*See Plate 8, Page 52*)

This Pin (131) is a plain pin riveted to the Feed Plate (135). Its function is to release the Stop Pawl (133) when the cartridges are being fed in.

### **Magazine Post.** (*See Plate 8, Page 52*)

The Magazine Post (79) is a round steel bush having a key solid with it, and is screwed to fit the Cover-Plate Catch (78) and pinned to it. A tapered hole is bored at the top and it is recessed to take the tongue on the magazine which secures the latter in position.



**Feed Pawl.** (*See Plate 8, Page 52*)

The Feed Pawl (136) has a spigot for engaging the hole in the Feed Plate (135) and is riveted to the latter by two rivets and the Spring Peg (139). It has two forks on the inside which engage with the cartridge in the Feed Block.

Its function is to push the cartridge into position in the Feed Block, opposite the Extractor (16).

**Cartridge Spring.** (*See Plates 5 and 8, Pages 49 and 52*)

The Cartridge Spring (48) is made of thin flat spring steel and is of such a shape that the long leaf bears against the Cartridge Guide (47) and the short leaf presses down the cartridges into position in the Feed Block, while a hole is formed for the Hinge Pin (48a).

**Cartridge Retainer, Spring and Securing Screw.**

(*See Plate 5, Page 49*)

The Cartridge Retainer (43), Spring (44) and Securing Screw (45) are fitted in the rear of the Feed Block (41). The Retainer (43) is pressed by the Spring against the cartridge in the Feed Block, while the cartridge is held on the other side by the Feed Pawl (136), and so the cartridge is gripped and prevented from falling back into the gun casing when firing at elevation.

**Magazine or Drum.** (*See Plate 1, Page 45*)

The magazine is a thin steel circular pressing, with a top to it, and having 25 serrations for engaging the Pawls. Steel strips are riveted inside to take the grooves in the base of the cartridges and the circular wall is stiffened by stays. There are 25 pins riveted to the top and these project downwards, the full length, just clear of the centre block. These pins are for holding the cartridges in position and for stripping them from the centre block. On the inside ring at the top of the magazine 25 serrations are cut, into any one of which a single spring catch fits for locking the magazine in relation to the centre block, when the magazine is removed from the Gun, and thus preventing the cartridges from being stripped from the magazine and falling to the ground.

The centre block is made of aluminium. It is bored at the centre to fit the Magazine Post and a keyway is cut for keying to the latter. The centre block is, therefore, stationary. Four grooves are cut round this block to receive the nose of the cartridges and there are ramps down from one tier to the next.

When the magazine is dropped into position on the Gun, a tongue, which projects downwards through the centre of the centre block, clips on to the Magazine Post and secures the magazine in position. At the same time, this tongue, which is attached to the spring catch, holds the catch in such a position that the magazine with its 25 pins is free to revolve.

Now the centre block being stationary and in definite relation to the centre line of the Gun, and the magazine and its pins being free to revolve, the cartridges are stripped from the magazine when the latter begins to revolve.

## **Jacket.**

*(See Plate 8, Page 52)*

The Jacket (94) around the Gun Barrel is of steel. It is screwed externally at the rear end to fit the Trunnion Block (93) and bored and screwed internally at the front end to fit the Barrel-Bearing Bush (95) and the Muzzle Attachment (96). A bearing is provided, near the rear end, for the Back-Sight Securing Ring (153a) and on the front end for the Fore-sight Securing Ring (147), while holes are drilled for Securing Screws (154) for the Sight Rings. The Jacket is perforated to allow the passage of air to keep the Gun Barrel (40) cool when firing.

## **Muzzle Attachment.**

*(See Plate 8, Page 52)*

The Muzzle Attachment (96) is a cylinder which is screwed into the end of the Jacket (94). It has a diaphragm in the front end through which is a hole, concentric with the bore of the Gun Barrel. Its function is to utilise the force of the gases escaping from the Barrel to increase the force of recoil and to reduce the flash.

## **SIGHT DETAILS.**

*(See Plate 8, Page 52)*

The Wind-Vane Fore Sight consists of the following parts :—

- (1) Fore-Sight Pillar (141)
- (2) Fore-Sight Bead Post (142)
- (3) Fore-Sight Bead (143)
- (4) Fore-Sight Upper Pivot Arm (144)
- (5) Fore-Sight Lower Pivot Arm (145)
- (6) Fore-Sight Stem (146)
- (7) Fore-Sight Securing Ring (147)
- (8) Fore-Sight Screws for Pivots (148)

- (9) Fore-Sight Wind-Vane (149)
- (10) Fore-Sight Wind-Vane Screws (149a)
- (11) Fore-Sight Pivots (150)

The Ring Back Sight consists of the following parts :—

- (1) Back-Sight Outer Ring (151)
- (2) Back-Sight Inner Ring (152)
- (3) Back-Sight Inner Ring Post (152a)
- (4) Back-Sight Stem for Ring (153)
- (5) Back-Sight Securing Ring (153a).
- (6) Sight-Stem Securing Screws (154).
- (7) Cover-Plate Support (154a)
- (8) Sight Securing Chain (155)
- (9) Split Pins (155a).

## THE WIND-VANE FORE SIGHT.

The Wind-Vane Fore Sight is mounted on the muzzle end of the Jacket (94).

### Securing Ring.

The Securing Ring (147) is a ring bored to fit the Jacket (94) with a vertical stem bored to take the Stem (146). It has a hole drilled and tapped for the Securing Screw (154), which secures the Ring (147) to the Jacket (94), a split-pin hole drilled in the top of the stem for securing the Stem (146) and a split-pin hole drilled in the bottom of the stem for securing the chain on the upper Split Pin to the bottom Split Pin.

### Stem.

The Stem (146) is turned to fit the stem on the Securing Ring (147) and bored to take the Pillar (141). It has a Split-pin hole drilled for securing it to the stem of the Securing Ring (147), and a hole drilled for a taper pin for securing the Pillar (141).

### Pillar.

The Pillar (141) is of square section at the top and is slotted out to take the upper and lower Pivot Arms (144 and 145) and drilled and tapped for the screws for Pivots (148). It is turned at the bottom to fit the Stem (146) and grooved for a taper pin, which secures it permanently to the Stem (146), but allows it free rotary movement.



## **Bead Post and Bead.**

The Bead Post (142) is of square section at the bottom and is slotted out to take the upper and lower Pivot Arms (144 and 145) and drilled and tapped for the screws for Pivots (148). It is turned at the top to receive the Bead (143) which is riveted to it.

## **Upper and Lower Pivot Arms.**

The Upper Pivot Arm (144) is a small flat steel plate, drilled at each end for the Pivots (150).

The Lower Pivot Arm (145) is made up of two steel plates brazed and riveted together and bent to a suitable shape to take the Wind Vane (149). Two holes are drilled for the Pivots (150) and four holes are drilled and tapped for the Wind-Vane Screws (149a).

## **Pivots and Pivot Screws.**

The Pivots (150) are small parallel pins with conical ends which work on conical holes prepared for them in the Screws (148).

The screws for Pivots (148) are plain screws with a hole in the centre and countersunk on the inside to suit the conical ends of the Pivots (150) and a saw cut on the outside.

## **THE RING BACK SIGHT**

The Ring Back Sight is mounted on the breech end of the Jacket (94).

## **Securing Ring.**

The Securing Ring (153a) is a Ring bored to fit the Jacket (94), with a vertical stem bored to take the Stem (153). It has a hole drilled and tapped for the Securing Screw (154) which secures the Ring (153a) to the Jacket (94), a split-pin hole drilled in the top of the stem for securing the Stem (153), a split-pin hole drilled in the bottom of the Stem for securing the Chain in the upper Split Pin to the bottom Split-Pin and a hole in the bottom of the stem for securing the Cover-Plate Support (154a).

## **Front-Cover-Plate Support.**

The Cover-Plate Support (154a) fits on and is secured to the stem of the Securing Ring (153a) and serves to support and locate the front end of the Front-Cover Plate (77).

## **Stem for Ring, Outer and Inner Rings and Post.**

The Stem for Ring (153), Outer Ring (151), the Inner Ring (152) and Post (152a) may be considered as one unit when assembled.

### **Stem for Ring.**

The Stem for Ring (153) is a round pin which fits into the Securing Ring (153a) with a head on it to receive the Outer Ring (151) which is riveted to it by two rivets. It is drilled and tapped to receive the Inner-Ring Post (152a).

### **Outer Ring.**

The Outer Ring (151) is a plain steel ring with two rivet holes for securing it to the stem on the Ring (153).

### **Inner Ring and Post.**

The Inner Ring (152) is a small steel ring with the hole well counter-sunk on both sides. It is drilled and tapped to take the screw on top of the Post (152a).

The Post (152a) is screwed at the top end to take the tapped hole in the Inner Ring and is brazed in. It is screwed at the bottom end to take the tapped hole in the stem for Ring (153).

## **THE WIND-VANE FORE SIGHT.**

### **General Principles.**

The Vickers Aircraft Observer's Gun (Class "F") is fixed to a free gun mounting, which allows the line of fire relative to the Gunner's aircraft to be varied at the will of the Gunner.

This type of free mounting introduces a new factor into the Sighting arrangements, as with a fixed Pilot's Gun it is only necessary to add together the velocity of the bullet and the velocity of the aircraft from which

the gun is fired, for the purpose of calculating the correction to be made, because, in this case, the bullet and the aircraft travel in the same line of flight.

The conditions, however, are different with a free Observer's Gun, and it is therefore, necessary to make Sighting arrangements which will allow for the effect of the velocity of the aircraft on the path of the bullet, at whatever angle the gun is fired relative to the line of flight of the aircraft.

For the Vickers Aircraft Observer's Gun (Class "F") a Wind-Vane Sight is provided to compensate for "own speed" (i.e., effect of the velocity of the aircraft on path of the bullet), and a Ring Sight to allow for the target angle of course and speed.

In designing the Ring Back Sight allowance is made for

- (1) A selected range.
- (2) The average speed of target aircraft.
- (3) The time of flight of bullet for selected range.
- (4) The speed of the gun platform.

In designing the Wind-Vane Fore Sight allowance is made for the velocity of the aircraft on the bullet at the moment of its departure from the muzzle of the gun.

The following conditions must be satisfied when this Sight is used :—

- (1) The Gunner's eye, the bead and the centre of the Ring must be in the same straight line.
- (2) The Sight must be so laid that the target aircraft is flying towards the centre of the Ring.

*Note.*—The underlying principles for the Ring Sight remain the same, whether used on a free, or a fixed gun.

The Ring Sight is fitted as a Back Sight, and the Wind-Vane Sight as a Fore Sight.



## RECOILING PARTS

### **Barrel.** (*See Plates 4 and 8, Pages 48 and 52*)

The Barrel (40) is formed with a square block at the breech end and is provided with two trunnions, solid with the Barrel (one on each side). Two vertical grooves are cut in the breech face to accommodate the projections on the Extractor (16). It is provided with a parallel part at the breech end to form a running bearing in the Trunnion Block (93) and a parallel part at the muzzle end to form a running bearing in the Barrel-Bearing Bush (95) and Muzzle Attachment (96).

### **Recoil Plates.** (*See Plate 3, Page 47*)

The Recoil Plates (36 and 38) are attached to the Trunnions on the Barrel (40) at their forward ends. At their rear ends, on the outsides, square projections are provided which form bearings for the Crank (26) and which slide in slots cut in the Side Plates (80 and 88). Flanges are provided on their inner bottom edges on which grooves in the Lock Frame (1) slide. Thin projecting pieces are provided on the rear end to cover up the slots in the Side Plates (80 and 88). The left hand Recoil Plate (38) is extended towards the front and has a recess cut in it for engaging the projecting piece on the Connecting Link (137). Rivet holes are drilled in the front ends for securing the Extractor-Holding-up Springs (37 and 39).

### **Connecting Link and Return Spring.** (*See Plate 5, Page 49*)

The Connecting Link (137) is placed underneath the Front-Cover Plate (77) and works in a slot in the latter. It has a Cam Pin on the top which engages the Cam Slot in the Feed Plate (135) and a projection on the bottom rear end which engages a slot in the left hand Recoil Plate (38). Small Rollers are fitted at each end to reduce the friction on the underside of the Front-Cover Plate (77) and facilitate the movement.

A Return Spring (137a) is provided to assist in returning the Connecting Link (137) to its normal position.

### **Crank.** (*See Plates 3 and 8, Pages 47 and 52*)

The Crank (26) is fitted between the rear of the Recoil Plates (36 and 38). On the right hand side, the crank spindle projects through the right hand

Side Plate (80) and carries the Crank Handle (29). On the left hand side, the crank spindle projects through the left hand Side Plate (88) and carries the Fuzee (32), to which are attached the Fuzee Links (33), the Fuzee Hook (34a) and the Fuzee Spring (34). The remainder of the Crank (26) is inside the gun casing, and when in normal position, the front end rests on the flanges of the Recoil Plates.

The Retaining Spring (26a) is permanently riveted to the Crank to prevent the Connecting Rod (23) falling into the bottom of the Gun when the Crank Pin (27) is removed.

### **Crank Handle.** (*See Plates 3 and 8, Pages 47 and 52*)

The Crank Handle (29) is on the outside of the right hand Side Plate (80) and is fitted and secured to the Crank. It is of lever shape, the rear end of which bears on the Roller (83) while the front end is fitted with a Knob (30) for hand operation.

### **Connecting Rod.** (*See Plates 3 and 8, Pages 47 and 52*)

The Connecting Rod (23) connects the Crank (26) to the Lock. One end revolves on the Crank Pin (27) the other end has a bayonet joint for fitting into the Lock Side Levers (13).

### **Lock.** (*See Plate 2, Page 46*)

The Lock is attached to the Connecting Rod (23) by a bayonet joint, and when in firing position, closes the breech. It is held in this position by the Side Levers (13), the Connecting Rod (23) and the Crank (26), which bears against the Guides on the Recoil Plates (36 and 38). The Lock has a reciprocating motion communicated to it by the rotation of the Crank (26) and is kept in position during its backward and forward movements by means of grooves in the Lock Frame (1) working on flanges on the Recoil Plates (36 and 38) as well as by the top of the Lock Frame (1) working in a Groove (71) in the Rear Cover (67).

The Axis Pin of the Safety Sear is in the Lock Frame (1).

The Lock consists of the following parts (arranged in the order of assembly) :—

- (1) Lock Frame (1)
- (2) Safety Sear (2) and Spring (3)
- (3) Firing Pin (5)
- (4) Tumbler (6)
- (5) Axis Pin (11) for Tumbler (6) and Lifting Levers (10 and 10a)
- (6) Hand Sear (7)
- (7) Axis Pin (8) for Hand Sear (7)
- (8) Extractor (16)
- (9) Gib (20)
- (10) Gib Spring (21)
- (11) Shutter (22)
- (12) Lifting Levers R.H. and L.H. (10 and 10a)
- (13) Side Levers (13)
- (14) Axis Pin (14) for Side Levers (13)
- (15) Spring Pin (15) for Side Levers (13)
- (16) Main Spring (9).

} Assembled.

### **Extractor** (*See Plate 2, Page 46*)

The Extractor (16) is attached to the fore end of the Lock Frame (1) by guide ribs on which it slides. It has grooves cut in the front to receive the base of the cartridge and is fitted with a Gib (20), Gib Spring (21) and Shutter (22).

The projections on the Gib (20) together with the grooves in the Extractor (16) form recesses which retain the cartridges in position.

To retain the Extractor in its top position during recoil, it is provided with two Horns (17) which slide on the Side Cams (82 and 90).

### **Side Levers, Lifting Levers and Holding up Springs.**

(*See Plates 2 and 3, Pages 46 and 47*)

The Extractor (16) is moved upwards by means of the Lifting Levers (10 and 10a) which are actuated by the Side Levers (13) and when in its highest position is retained there by two flat Extractor-Holding Up Springs (37 and 39). These Springs are riveted to the Recoil Plates (36 and 38) near the Barrel, and ensure the hole in the Extractor (16) for the Firing Pin (5) being opposite the centre of the base of the cartridge when the Lock is home.



The upward and downward movements of the Extractor (16) are guided by ribs and limited by stops. The upper and lower stops form part of the Lock Frame.

The lower stop limits the drop of the Extractor (16) by limiting the drop of the Lifting Levers (10 and 10a).

### **The Fuzee Spring (or Lock Return Spring).**

*(See Plate 4, Page 48)*

On the left side of the gun casing is a strong spiral Tension Spring (34), called the Fuzee Spring. It is attached to the Fuzee-Spring Bracket (91) at the front end and to the Crank at the rear end by means of the Fuzee Hook (34a), the Fuzee Link (33b) and the Fuzee (32).

Provision is made to vary the initial tension on the Spring by means of a Tension Screw (35) and a Vice Handle (35a).

The Fuzee Spring returns both Barrel and Lock to the firing position.

## **ACTION OF THE MECHANISM**

### **To Prepare for Firing.**

For initial loading by hand, a special Trigger and Hand-Loading Gear are provided (see page 4).

The Gun is prepared for firing as follows :—

- (1) See that the Trigger (59) is locked by the Safety Catch (64) ;
- (2) Pull back the Trigger (110) with the left hand and hold it. This forces out the Loading Plunger (100) ;
- (3) Take hold of the Crank Handle (29) with the right hand and turn it to the rear until the toe of the Crank Handle bears against the Loading Plunger (100).

This withdraws the Lock to the rear.

The toe of the Crank Handle now becomes its fulcrum.

Continue to turn the Handle (29) to the rear.

This withdraws the Gun Barrel (40) and Recoil Plates (36 and 38) to the rear and further withdraws the Lock.

During the latter part of this movement, the left hand Recoil Plate (38) being connected to the Connecting Link (137) and the pin on top of this Link being engaged in the cam slot in the Feed Plate (135), the latter, with the Actuating Pawl (134) attached to it, is given an anti-clockwise movement to enable the Actuating Pawl (134) to engage in the next groove in the magazine. At the same time, the Retaining Pawl (134) which is fixed to the Cover Plate (77) holds the magazine stationary, and the Pin (131), which is fixed to the front end of the Feed Plate (135), pushes the Stop Pawl (133) clear of the magazine to allow the latter to be moved round clockwise when the Crank Handle (29) is released (see Plate 11—Plan View, Gun in Recoiled position).

- (4) Release the Trigger (110) and then release the Crank Handle (29).

This sends the Crank Handle (29) and the Lock back to the firing position, under the action of the Fuzee Spring (34).

During the first part of this forward movement, the Barrel (40) and Recoil Plates (36 and 38) are returned to the firing position, the Actuating Pawl (134) pushing the magazine round clockwise one notch, thus stripping a live Cartridge from the magazine and pushing it under the Cartridge Guide (47) and Spring (48). The Spring then forces the cartridge down into the Feed Block (41), while the Feed Pawl (136) pushes it over against the Cartridge Retainer (43) where it is held between the Feed Pawl (136) and the Cartridge Retainer (43), in the correct position for being properly gripped by the Extractor (16). The cartridge is thus prevented from falling backward when the Gun is at elevation.

In the meantime, the Stop Pawl (133) has returned to normal to engage the Magazine, and the Lock has moved forward by an amount equal to the recoil, namely about 1 inch, but is still well to the rear. It is thus ensured that a live cartridge has been placed in position in the Feed Block (41), ready to be properly gripped by the Extractor (16), before the Lock runs forward to the firing position.

During the second part of the forward movement, the Lock runs forward to the firing position, raising the Extractor (16) which now grips the first live cartridge in the Feed Block (41).

- (5) Again pull back the Trigger (110) with the left hand and hold it, and again take hold of the Crank Handle (29) with the right hand and turn it to the rear as far as it will go.

This withdraws the first live cartridge from the Feed Block (41), places it in line with the axis of the Gun Barrel (40) and brings the second live cartridge into line in the Feed Block, the action of the Feed Mechanism being the same as explained in operations 2 and 3 on Page 20.

- (6) Again release the Trigger (110) and then release the Crank Handle (29).

This allows the Lock to run forward again to the firing position, placing the first live Cartridge in the Gun Barrel (40) while the Extractor (16) rises and grips the second live cartridge in the Feed Block, the action of the Feed Mechanism being the same as explained in operation 4 on Page 21.

There are now two live cartridges in the face of the Extractor (16).

During this process the Lock becomes "cocked" and the Gun is ready for firing.

*Note.*—Should the Trigger (110) not be released, no damage can result as the Plunger (100) can act independently of the Trigger and is automatically pushed inwards on a smart release of the Crank Handle (29).

## **Firing the First Shot.**

It is assumed that the Lock and Barrel are fully home in the firing position. When in this position, the Safety Sear (2) is released and the Bent on the bottom of the Hand Sear (7) is engaged with the Bent of the Tumbler.



To fire the Gun, raise the Safety Catch (64) and pull the Trigger (59).

When the Trigger (59) is pressed, the Actuating Bar (61) is pulled to the rear, and a projection on the front end engaging with a Projection (76) on the rear end of the Trigger Bar (74), the latter is moved to the rear. At the front end of the Trigger Bar (74) a slot is cut, into which the top end of the Hand Sear (7) engages, the slot being long enough to allow for the full recoil of the Lock. Normally, the Hand Sear (7) is just clear of the inside face of the front end of the Trigger Bar (74), and when the Trigger Bar (74) is moved to the rear it pushes over the tail of the Hand Sear (7) against the action of the short leaf of the Main Spring (9) and disengages the Bent of the Hand Sear (7) from the Bent of the Tumbler (6). The Firing Pin (5) is now free (the Safety Sear (2), when the Lock is right home, being released) to move on to the cap of the cartridge, under the action of the long leaf of the Main Spring (9) and to fire the cartridge. When the Gun has been fired, the tail of the Tumbler (6) rests on the rear of the Side Lever (13).

## **Recoil Action.**

Suppose the Gun to have just fired, the force of the explosion causes the recoiling parts to move to the rear through a distance of about one inch, thereby extending the Fuzee Spring by this amount. During this recoil, the tail of the Crank Handle (29) presses against, and travels under, the Roller (83), imparting a quick upward movement to the Crank Handle (29) thus rotating the Crank (26), drawing back the Lock and giving a further extension to the Fuzee Spring (34). By this means the greater part of the energy of recoil is transmitted to the Crank (26).

The travel of the recoiling parts to the rear also moves the Feed Plate (135) anti-clockwise, in the manner described in "To Prepare for Firing" (see operation 3, page 20) ready to feed the next cartridge into the Feed Block (41) on the running forward movement.

When the Lock moves to the rear, the Extractor (16) extracts the empty case from the Barrel (40) and withdraws a fresh cartridge from the Feed Block (41). The Extractor is kept in position during recoil by its Horns (17) which move along the upper surface of the Cams (82 and 90) inside the Breech Casing, until the cartridge is well clear of the Feed Block (41). When it reaches the rear end of these Cams, it falls, partly by its own weight

and partly by the action of the Guides (72), underneath the Rear Cover (67), thus bringing the cartridge drawn from the Feed Block (41) in line with the centre line of the Barrel (40) with the empty case beneath it.

The empty case is nearly always ejected on the recoil movement.

### **Cocking Action.**

The turning of the Crank Handle (29) to the rear not only draws the Lock away from the Barrel (40) but also gives an upward movement to the Connecting Rod (23) and rear end of the Side Levers (13) which, bearing on the tail end of the Tumbler (6), rotates it on its axis, and the head of the Tumbler (6) being engaged in a recess in the Firing Pin (5), forces the latter to the rear, against the action of the long leaf of the Main Spring (9).

When the Bent of the Tumbler (6) has moved below the Bent of the Hand Sear (7) the latter is forced to engage with the former by the action of the short leaf of the Main Spring (9) and the Tumbler (6) and Firing Pin (5) are held in the "cocked" position.

The continued movement of the Tumbler (6) carries back the Firing Pin (5) until the Safety Sear (2) [which is below and acted upon by the Safety Sear Spring (3)] is forced into the Bent of the Firing Pin (5) and retains it.

The Firing Pin (5) is thus prevented from running forward by two actions, namely, that of the Hand Sear (7) and that of the Safety Sear (2).

### **Action of the Fuzee Spring.**

When the Gun is fired, the force of the explosion sends the whole of the recoiling parts to the rear and moves the Feed Plate (135) anti-clockwise, in the manner described in "To Prepare for Firing" (see operation 3, page 20), ready to feed the next cartridge into the Feed Block (41) on the running forward movement.

During this movement, the toe of the Crank Handle (29) is forced sharply against the Roller (83) and this action gives a quick upward and rearward movement to the Crank Handle (29). The Crank Handle (29) being connected to the Fuzee Spring (34) on the other side of the Gun by means of the Crank (26), the Fuzee (32), the Link (33b) and the Hook (34a),

the movement of recoil extends the Fuzee Spring (34) and, at the same time, the turn of the Crank Handle (29) winds the Link (33b) on to the Fuzee (32) and gives a further extension to the Fuzee Spring (34). This Spring has, therefore, been extended by an amount equal to the recoil (namely, one inch = 25 m/m), plus an amount equal to the turn of the Crank Handle (29).

There is now a considerable amount of energy stored up in the Fuzee Spring (34) and when the energy of recoil has expended itself, the energy stored up in the Spring is released and used to send the Barrel (40) and recoiling parts forward into the home position as well as to actuate the Feed Plate (135) to feed another cartridge into the Feed Block (41) ready to be gripped by the Extractor (16).

On the release of the Fuzee Spring (34), the first part of the forward movement gives up the one inch extension due to recoil and the Barrel (40) and Crank (26) move forward into the home position. The Crank Handle (29), however, has not yet commenced to turn. The Lock, therefore, is still at the rear. It is thus ensured that the barrel has run forward into the firing position and a fresh cartridge has been placed in the Feed Block (41) before the Lock can run forward into the firing position.

During the second part of the running forward movement, the pull of the Fuzee Spring (34) on the Fuzee (32) due to the remaining extension in the Fuzee Spring (34) now unwinds the Link (33b) from the Fuzee (32), gives a forward rotation to the Crank (26) and sends home the Lock to the firing position.

### **Forward Movement of the Lock.**

As the Lock moves forward into the firing position, the Extractor (16) carries a live cartridge, and possibly an empty case, and the Extractor having dropped, the live cartridge is placed in the Barrel chamber with the empty case beneath it. During this process, the Extractor (16) is moved upward by the Lifting Levers (10 and 10a) which are actuated by the Side Levers (13), and the empty case, if still gripped by the Extractor (16), is ejected.

As the Extractor rises, the projecting Gib (20) on the Extractor (16) slides over the live cartridge in the Barrel (40), until the firing pin hole in the Extractor (16) is opposite the centre of the cartridge in the Barrel (being held there by the Extractor-Holding-up Springs (37 and 39) and the top



of the Extractor (16) is engaging another cartridge which has been automatically moved into position in the Feed Block (41) by the action of the Connecting Link (137) on the Feed Plate (135), assisted by the Connecting-Link Return Spring (137a).

There are now two live cartridges in the face of the Extractor (16).

### **Final Movement of the Lock (Forward)**

At the final movement of the Lock, the Extractor (16) reaches its highest position before the Side Levers (13) have quite finished their travel, so that, during the last part of their movement, the points of the Side Levers (13) press against the inclined surface of the Bents of the Lifting Levers (10 and 10a), thus imparting a final forward movement to the Lock, tightening up all the joints in the breech mechanism and supporting it firmly against the breech at the instant of explosion.

During this movement, the rear of the Side Levers (13) pressing down on the tail of the Safety Sear (2) disengages the Bent of the Safety Sear (2) from the Bent of the Firing Pin (5) and so releases the Safety Sear (2) from the Firing Pin (5).

The release of the Safety Sear (2) from the Firing Pin (5) is so timed that it cannot take place until after the Lock is in the firing position and has been tightened up against the breech by the last forward movement of the Crank (26).

### **Firing of Subsequent Shots (Automatic Firing)**

The firing of the first shot is performed by raising the Safety Catch (64) and pulling back the Trigger (59) as previously explained.

In automatic firing, if the Trigger (59) is held back, the Trigger Bar (74) is held to the rear. Then, as regards cocking, recoil, and running forward, the parts function normally, as explained in "Firing the First Shot." Each time the Lock goes forward, however, the top of the Hand Sear (7) comes into contact with the inside face on the front part of the Trigger Bar (74) thus pushing over the Hand Sear (7) against the action of the short leaf of the Main Spring (9) and disengaging the Bent of the Hand Sear (7) from the Bent of the Tumbler (6).

The Firing Pin (5) is now held by the Safety Sear (2) only. As the Crank Handle (29) returns to normal, the Lock moves forward and the

Connecting Rod (23) and Side Levers (13) have a downward movement, so that when the Lock reaches its most forward position, the Connecting Rod (23) lies in a horizontal position and the rear of the Side Levers (13) depresses the tail of the Safety Sear (2), thus disengaging the Bent of the Safety Sear (2) from the Bent of the Firing Pin (5). Both Safety Sear (2) and Hand Sear (7) have now been released and the Firing Pin (5) is quite free to fly forward on to the cap, under the action of the long leaf of the Main Spring (9), and to fire the cartridge.

This action is repeated as long as the Trigger (59) is held and there are cartridges in the magazine.

### **Action on Release of the Trigger (Cease Fire)**

If, while firing, the Trigger (59) is released sharply, the Trigger Bar (74) returns to normal (just clear of the Hand Sear (7)) under the action of the Small Spring (75). Thus the Hand Sear (7) is out of action while retaining the Firing Pin (5), so that, if there are still rounds in the magazine when the Lock runs home, no further action takes place and the Gun stands ready for firing with two live cartridges in the Extractor (16).

## **GENERAL INSTRUCTIONS**

Experience has shown that, during ordinary firing, the parts most susceptible to wear are the Firing Pin (5) and the Main Spring (9).

If, during prolonged firing, a part such as the Lock, becomes worn or damaged, it should be removed and replaced by a spare Lock, an operation which takes only a few seconds. If, however, the original Lock is subsequently made fit for use by replacing the worn out part by a new part taken from the set of spare parts, this Lock should be again taken into use and the spare Lock, if still in good condition, should be returned to the spare part box.

### **To Remove the Lock.**

Open the Rear Cover (67), turn the Crank Handle (29) as far to the rear as possible and see that the Extractor (16) drops.

Take hold of the Upper Extractor Stop and raise the Lock, allowing the Crank Handle (29) to return slowly. If there are any live cartridges in the Extractor (16) remove them while the latter is down. Take hold of the Lock in front, give it one sixth of a turn to either side and lift it out.

When the Lock is out of the Gun and it is necessary to release the Main Spring (9), great care should be taken before doing so to see that the Extractor (16) is at its highest point ; the firing-pin hole in the Extractor (16) will then be in line with the Firing Pin (5).

### **To Replace the Lock.**

Cock the Lock by lifting the Side Lever (13) ; see that the Connecting Rod (23) is upright, then, after giving the Lock one sixth of a turn to either side, slip the rear end of the Side Lever (13) over the end of the Connecting Rod (23), as far as it will go, turn the Lock to the front and lower it into the Breech Casing, while turning the Crank Handle (29) over to the rear. Then see that the Lock flanges are engaging in their guides on the Recoil Plates (36 and 38) and let go the Crank Handle (29).

### **To Remove the Feed Block.**

To remove the Feed Block (41) for replacing broken parts, release the Catch (78), and open the Front Cover Plate (77). The Feed Block (41) can then be removed by lifting vertically upwards.

### **To Replace the Feed Block.**

Open the Front Cover Plate (77) and force the Feed Block (41) down into position.

### **To Remove the Fuzee Spring Bracket.**

Press the Bracket (91) forward, until the Lugs are clear of the Keeper Studs, and disconnect the Fuzee (32) from the Crank (26). The Fuzee (32), Link (33b), Hook (34a), Fuzee Spring (34), Tension Screw (35) and Fuzee Spring Bracket (91), which are all connected, can then be removed as one unit.

### **To Replace the Fuzee Spring Bracket.**

To replace the Fuzee-Spring Bracket, reverse the foregoing operations.

### **To Keep the Gun in Working Order.**

Before taking the Gun into action, the surfaces on which all moving parts work should be thoroughly lubricated with non-freezing oil, especially the following :—

- (a) Bearing parts of the Barrel (40) and all recoiling parts.



- (b) The Lock guides on the Recoil Plates (36 and 38) as well as the working parts of the Lock itself. These include the internal components which can easily be lubricated through the opening in the upper part of the Lock Frame (1), in addition to the external parts such as the Levers (10, 10a and 13) and the Extractor (16).
- (c) The working parts of the Feed Plate (135), the Cartridge Guide (47), the Connecting Link (137) and the inside of the Feed Block (41).
- (d) The Bearings of the Crank (26), as far as they can be reached without stripping the Gun.

### **To Test the Friction of Recoiling Parts.**

In order to see that the Recoiling Parts work freely, remove the Fuzee-Spring Bracket (91), take out the Lock, turn the Crank Handle (29) upwards, take hold of it with the right hand and the Fuzee (32) with the left, then slide the Recoiling Parts backwards and forwards to see that they move easily and that the Barrel (40) goes right home.

### **To Test the Pull of the Fuzee Spring (as measured on the Crank Handle).**

Pull the Fuzee Spring (34) with a spring balance, proceeding as follows :—

First open the Rear Cover (67) and remove the Lock. Then place the loop of the spring balance upon the Knob (30) of the Crank Handle (29) and pull vertically upwards. The reading indicated when the Crank Handle (29) *commences* to move, will be the pull of the Fuzee Spring (34) as measured on the Crank Handle (29).

### **Points to be Attended to Before Firing.**

- (a) Examine the Barrel (40) and see that the bore is clear. This can easily be done by removing the Lock and looking through the bore after the Back Block (55) has been turned down for the purpose.

See that the spare Lock is close at hand in case of need.

- (c) Examine the ammunition and see that it is of the proper description and that the magazine is correctly filled.

## Points to be Attended to During Firing.

- (a) That the hand is kept clear of the Crank Handle (29) to avoid risk of injury.
- (b) That the Magazine is ON NO ACCOUNT handled when the Gun is firing.
- (c) That the Magazine is refilled without delay.

## Points to be Attended to After Firing.

- (a) That the Gun is unloaded and the magazine removed.
- (b) That the Safety Catch (64) is in the safe position.
- (c) That the Barrel (40) is cleaned out and oiled immediately after firing to prevent erosion.
- (d) That the Main Spring (9) is released.
- (e) That in collecting the empty cases there are no live cartridges amongst them.
- (f) That the Lock is taken out, the Extractor (16), the Firing Pin (5) and Springs (9, 3 and 21), are examined to see that they are not damaged.

*Note.*—It will not be necessary to strip the Lock to do this.

## To Strip the Gun.

Remove the Feed Block (41) as previously described.

Open the Rear Cover (67) and remove the Lock.

Press the Fuzee-Spring Bracket (91) forward, and take off the Bracket (91), Spring (34), Tension Screw (35), Link (33b), Hook (34a), and Fuzee (32), removing the Fuzee (32) from the Crank (26).

Unscrew and remove the "T" Pin (58) which fixes the Back Block (55), and turn down the Back Block.

Pull out the Filling-in Pieces (81 and 89) and remove the Muzzle Attachment (96).

Draw the Barrel (40), Recoil Plates (36 and 38) and Crank (26) out from the rear.

Unscrew the Nut (73a) from the Axis Pin (73) and remove the Axis Pin (73) and Front Cover Plate (77) with Feed Plate (135).

Withdraw the Hinge Pins (67c) from the Hinges (67b) on the left hand Side Plate (88) and remove the Rear Cover (67).

Unscrew and remove the Hinge Pin (57) of the Back Block (55) and remove the Back Block.

Withdraw the Split Pin (84a) from the Roller Collar (84) and remove the Roller Collar (84) and Roller (83).

### **To Assemble the Gun.**

Place the Roller (83) and Roller Collar (84) in position and insert the Split Pin (84a).

Place the Back Block (55) in position, insert the Hinge Pin (57), and screw on the Nut (57a).

Place the Rear Cover (67) in position and insert the Hinge Pins (67c).

Place the Front Cover Plate (77) with Feed Plate (135) in position, insert the Axis Pin (73) and screw on the Nut (73a).

Insert the Barrel (40), Recoil Plates (36 and 38) and Crank (26) from the rear.

Fix the Muzzle Attachment (96) and insert the Filling-in Pieces (81 and 89).

Turn up the Back Block (55) on its Hinge and screw in the "T" Pin (58).

Place the Fuzee (32) on the crank spindle and connect to the Fuzee Spring (34) by means of the Link (33b) and Hook (34a); then fix the Fuzee Spring (34) to the Fuzee Spring Bracket (91) and place all these parts in position.

Open the Rear Cover (67) and insert the Lock, then close the Rear Cover.

Open the Front-Cover Plate (77) and insert the Feed Block (41), then close the Front-Cover Plate.

### **To Strip the Feed Block.**

Remove the Feed Block (41) from the Gun.

Unscrew the Cartridge Retainer Securing Screw (45) and remove this Screw, with Cartridge Retainer Spring (44) and Cartridge Retainer (43).



## **To Assemble the Feed Block.**

Reverse the foregoing operations.

## **To Strip the Lock.**

Remove the Lock from the Gun.

With the "T" Pin (58) from the Back Block (55) press out the Side Lever Axis Pin (14) and the Spring Pin (15).

Remove the Side Levers (13) and Lifting Levers (10 and 10a) and slide off the Extractor (16).

Press the Safety Sear (2) down and fire the Lock.

Press out the Tumbler Axis Pin (11) and remove the Tumbler (6).

Press out the Hand-Sear Axis Pin (8) and remove the Hand Sear (7) and Main Spring (9).

Press the Safety Sear (2) down and shake out the Firing Pin (5), then raise the Safety Sear (2) unhook and remove it.

Push out the Gib Shutter (22) on the Extractor (16) and remove the Gib Spring (21) and the Gib (20).

## **To Assemble the Lock.**

Insert the Gib (20) and its Spring (21) in the Extractor (16) and slide on the Gib Shutter (22).

Insert the Safety Sear (2) and the Firing Pin (5).

"Place" the Tumbler (6) and its Axis Pin (11).

"Place" the Hand Sear (7) and its Axis Pin (8).

Slide the Extractor (16) on to the Lock Frame (1).

Put on the Lifting Levers (10 and 10a).

Put on the Side Levers (13) and secure them with their Axis Pin (14) and Spring Pin (15).

Then ease the Firing Pin (5) right forward, insert the Main Spring (9) and push it into place.

## **THE CARE AND MAINTENANCE OF VICKERS MACHINE GUNS.**

It is very important that the bore and chamber should be oiled immediately after firing to prevent erosion.

### **Cleaning and Lubrication.**

When cleaning the gun, turpentine or oil should be used. Emery cloth or other abrasive substance should NOT be used. Before assembling the Gun, try each Part in its place separately to see that it works freely.

The Gun should be lubricated with a thin mineral oil, which shall not cease to flow when exposed to a temperature of minus 45° C. It must be free from acid, dirt, suspended matter and water.

### **Examination of Components After Practice Flights.**

The Locks should be taken out and the Extractors, Firing Pins and Springs examined to ascertain that they are all correct.

It will not be necessary to strip the Lock to do this.

### **Monthly Examination.**

All Machine Guns must be thoroughly examined every month and left in a properly lubricated and serviceable condition.

The following Parts should therefore be removed, properly cleaned and re-oiled or greased :—

Lock, Feed Block (41), Feed Mechanism (complete), Fuzee (32), Fuzee Bracket (91), Fuzee Spring (34), Back Block (55), Filling-in Pieces (81 and 89), Roller (83), and Roller Collar (84), Muzzle Attachment (96), Barrel (40), Recoil Plates (36 and 38) and Crank (26).

### **Object of Spare Lock.**

The Spare Lock is provided to enable the Lock in the Gun to be rapidly replaced in the event of a broken Main Spring (9) or Firing Pin (5).

The change of Locks is so readily effected that the Gun is only a moment out of action.

## FAILURES THAT MAY OCCUR AND HOW TO REMEDY THEM.

The Vickers Automatic Gun has the advantage of having all its Mechanism in two principal components, namely, the Lock and the Feed Mechanism.

The Feed Mechanism can be cleared readily in the event of a stoppage, but should the fault lie with the Lock, it is so easy to remove and replace it with a spare one that this is the usual course to adopt.

When a Stoppage occurs, it is only necessary to know which of the two parts named is responsible and to act as suggested.

Stoppages during firing may be classed under two headings :—

(1) PROLONGED, which are due to :—

Failure of some part which cannot be put right immediately and which, necessarily, puts the Gun out of action for a more or less prolonged period.

Such stoppages, which are very unlikely to occur, might be caused either by :—

(a) Broken Fuzee.

(b) Broken Fuzee Spring.

(2) TEMPORARY, which are due to :—

(a) Failure in the Lock, or Faulty Ammunition.

(b) Some cause which can generally be avoided by a high standard of training and a thorough knowledge of the Gun by the Gunner.

It is obvious that to clear stoppages, the Gunner must be thoroughly trained in the mechanism of the Gun and the possible causes of the various stoppages.

In order to minimise these stoppages, the ammunition should be carefully tested and only correct rounds filled into the Magazine.



## TEMPORARY STOPPAGES

The following Table of Temporary Stoppages, set out in three columns, gives a clear indication of the Cause of and the "Remedy" for each Stoppage.

### Column 1.

Shows the four positions of the Crank Handle in which the Gun may stop firing. The first three positions vary very slightly.

The position of the Handle affords a ready indication of the correct "Remedy" to be applied.

### Column 2.

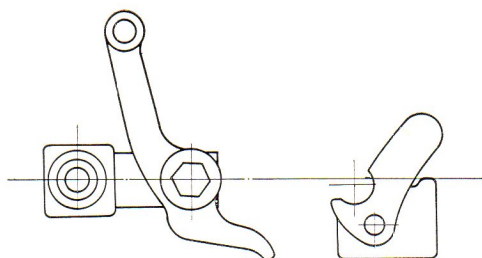
Gives the Cause of the Stoppage.

### Column 3.

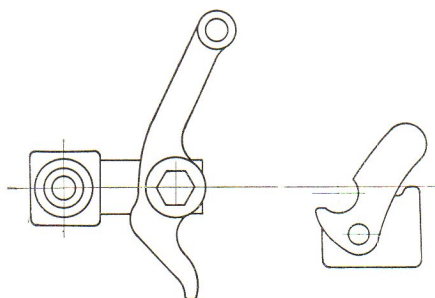
Gives the "Remedy" necessary to prevent a recurrence of the Stoppage.

### TABLE OF TEMPORARY STOPPAGES

1	2	3
Position of the Crank Handle	Cause	"Remedy"
Stoppage No. 1 <i>See Plate opposite</i>	(1) Faulty Ammunition (2) Cartridges too tight in the Magazine. (3) Excessive friction due to congealed Oil	(1) Inspection of Ammunition (2) Compliance with the "Points before Firing" (3) Repeat firing until the Gun is warmed up
Stoppage No. 2 <i>See Plate opposite</i>	(1) Separated Case, due to insufficient support of the Lock on the base of the Cartridge giving excessive head space (2) Separated Part of the Case in the Chamber	(1) Draw back the Crank Handle, until the Horns of the Extractor are retained by the Steps on the Side Cams. Push out the Cartridge from the Extractor by means of the Butt End of the Clearing Plug  Release the Crank Handle. Reload and Fire, with Loading Plunger in operation (2) Use the Clearing Plug to remove the separated Case. Reload and fire



**Stoppage No. 1.**



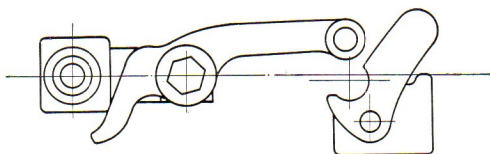
**Stoppage No. 2.**

**Approximate Positions of Crank Handle for Stoppages  
Nos. 1 & 2.**

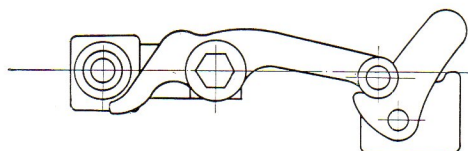
TABLE OF TEMPORARY STOPPAGES (continued)

I	2	3
Position of the Crank Handle	Cause	" Remedy "
Stoppage No. 3 <i>See Plate opposite</i>	(1) Excessive Friction due to congealed Oil	(1) }
	(2) Friction on the face of the Lock obstructing the upward movement of the Extractor	(2) } Strike down sharply on the Crank Handle with a glancing blow, to prevent injuring the hand, and Fire
	(3) Faulty Feed	(3) & }
	(4) Fuzee Spring too weak	(4) } <i>If this fails, proceed as follows :—</i>
	(1) Excessive friction due to congealed Oil	(1) Repeat Firing until the Gun is warmed up
	(2) Friction on the face of the Lock obstructing the upward movement of the Lock	(2) Draw back the Crank Handle until the Horns of the Extractor are retained by the Steps on the Side Cams. Examine these Parts and see that they are well oiled
	(3) Faulty Feed	(3) [a] Draw back the Crank Handle until the Horns of the Extractor are retained by the Steps on the Side Cams. [b] Examine the Feed Block and see that the Cartridges are correctly fed in Block [c] Pull Crank Handle fully back with Loading Plunger in operation. [d] Release the Crank Handle [e] Fire
	(4) Fuzee Spring too weak	(4) Increase the initial tension on the Spring
Stoppage No. 4 <i>See Plate opposite</i>	(1) Misfire (Defective Ammunition)	(1) [a] Function the Gun with the Loading Plunger in operation This action ejects the faulty Cartridge and puts a fresh one in the Barrel [b] Fire
	(2) Broken or Damaged Firing Pin	(2) } Unload & } Remove the Lock and replace by a spare one
	(3) Broken or Damaged Main Spring	(3) } Re-load and Fire





**Stoppage No. 3.**



**Stoppage No. 4.**

**Approximate Positions of Crank Handle for Stoppages  
Nos. 3 & 4.**

## POINTS TO BE OBSERVED BEFORE, DURING AND AFTER A FLIGHT

### BEFORE A FLIGHT.

- (1) See that the Barrel (40) is clear and dry.
- (2) Oil the frictional parts lightly with a non-freezing lubricant, samples of which will be supplied on application.
- (3) Check the pull of the Fuzee Spring (34) on the Crank Handle (29) with a spring balance.

This must not exceed 12 lbs.

- (4) Inspect the Muzzle Attachment (96). This should be clean and bright and screwed on tightly.
- (5) See that the magazine is correctly filled.
- (6) See that the sights are correctly adjusted and aligned.
- (7) See that the cleaning rod and spare Lock are handy.
- (8) See that the Gun is ready loaded and, if possible, fire a few rounds before commencing a flight.

### DURING A FLIGHT.

- (1) Fire occasional bursts to prevent the working parts becoming clogged by congealed oil.
- (2) Unload the Gun before landing.

### AFTER A FLIGHT.

- (1) See that the Gun is unloaded.
- (2) Remove the recoiling parts, thoroughly clean and re-oil them.
- (3) Clean the non-recoiling parts, removing clogged oil by means of spirits of turpentine or similar medium. Then re-oil them.
- (4) Re-fill the magazines.
- (5) Examine the Sights.
- (6) Any defects, which have been noted during the flight, should be immediately remedied.

# LIST OF PARTS

Part No.  
on Arrgt.

## NOMENCLATURE

1	..	..	Lock Frame.
2	..	..	Safety Sear.
3	..	..	Safety-Sear Spring.
4	..	..	Safety-Sear Axis Pin (part of Lock Frame).
5	..	..	Firing Pin.
6	..	..	Tumbler.
7	..	..	Hand Sear.
8	..	..	Hand-Sear Axis Pin.
9	..	..	Main Spring.
10	..	..	Lifting Lever, R.H.
10a	..	..	Lifting Lever, L.H.
11	..	..	Axis Pin for Lifting Levers and Tumbler.
12	..	..	Lower Stop for Extractor (part of Lock Frame).
13	..	..	Side Levers.
14	..	..	Side-Lever Axis Pin.
15	..	..	Side Lever Spring Pin.
16	..	..	Extractor.
17	..	..	Horns on Extractor (part of Extractor).
18	..	..	Upper Stop for Extractor (part of Lock Frame)
19	..	..	Groove for Extractor-Holding-up Spring (cut in Extractor.
20	..	..	Gib.
21	..	..	Gib Spring.
22	..	..	Gib-Spring Shutter.
23	..	..	Connecting Rod.
24	..	..	Connecting-Rod Adjusting Nut.
25	..	..	Connecting-Rod Adjusting Washer.
26	..	..	Crank.
26a	..	..	Retaining Spring.
27	..	..	Crank Pin.
27a	..	..	Crank-Pin Securing Pin.
28	..	..	Crank Axis.
29	..	..	Crank Handle.



# LIST OF PARTS (continued).

Part No. on Arrgt.	NOMENCLATURE	
30 .. ..	Crank-Handle Knob.	
31 .. ..	Crank-Handle Securing Screw.	
32 .. ..	Fuzee.	
33b .. ..	Fuzee Link.	
34 .. ..	Fuzee Spring.	
34a .. ..	Fuzee-Spring Hook.	
34b .. ..	Fuzee-Spring Nut.	
35 .. ..	Fuzee Spring Tension Screw.	
35a .. ..	Fuzee-Spring Tension Screw Vise Handle.	
36 .. ..	Recoil Plate, R.H.	
37 .. ..	Extractor-Holding-up Spring, R.H.	
38 .. ..	Recoil Plate, L.H.	
38a .. ..	Guides on Recoil Plate (part of Recoil Plate).	
39 .. ..	Extractor-Holding-up Spring, L.H.	
39a .. ..	Extractor-Holding-up Spring Rivets.	
40 .. ..	Barrel.	
41 .. ..	Feed Block.	
43 .. ..	Cartridge Retainer.	
44 .. ..	Cartridge-Retainer Spring.	
45 .. ..	Cartridge-Retainer Securing Screw.	
47 .. ..	Cartridge Guide.	
48 .. ..	Cartridge-Guide Spring.	
48a .. ..	Cartridge-Guide-Spring Pin.	
53 .. ..	Cover-Plate Hinge.	
55 .. ..	Back Block.	
56 .. ..	Grip Frame.	
56a .. ..	Grip.	
56b .. ..	Grip Screws and Nuts.	
57 .. ..	Back-Block Hinge Pin.	
57a .. ..	Back-Block Hinge-Pin Nut.	
58 .. ..	Back-Block Fixing Pin ("T" Pin).	
59 .. ..	Trigger.	
60 .. ..	Trigger Axis Pin.	
60a .. ..	Trigger-Axis-Pin Catch.	

# LIST OF PARTS (continued).

Part No. on Arrgt.	NOMENCLATURE	
61 .. ..	Actuating Bar.	
62 .. ..	Grip-Frame Bolts.	
63 .. ..	Grip-Frame Nuts.	
64 .. ..	Safety Catch.	
65 .. ..	Safety-Catch Axis Pin.	
66 .. ..	Actuating-Bar Spring.	
67 .. ..	Rear Cover.	
67a .. ..	Rear-Cover Hinge (part I).	
67b .. ..	Rear-Cover Hinge (part II).	
67c .. ..	Rear-Cover Hinge Pin.	
68 .. ..	Rear-Cover Catch.	
69 .. ..	Rear-Cover Distance-Piece Pin.	
69a .. ..	Rear-Cover Distance Piece.	
70 .. ..	Rear-Cover Catch Spring.	
70a .. ..	Rear-Cover Catch Pin.	
70b .. ..	Rear-Cover Catch Bracket.	
71 .. ..	Lock-Frame Grooves in Rear Cover (part of Cover).	
72 .. ..	Extractor Guides on Rear Cover.	
73 .. ..	Front-Cover-Plate-Hinge Axis Pin.	
73a .. ..	Front-Cover-Plate-Hinge-Axis-Pin Nut.	
73b .. ..	Front-Cover-Plate-Hinge-Axis Pin-Nut Pin.	
74 .. ..	Trigger Bar.	
75 .. ..	Trigger-Bar Spring.	
76 .. ..	Trigger-Bar Projection (part of Trigger Bar).	
77 .. ..	Front Cover Plate.	
78 .. ..	Front-Cover-Plate Catch.	
78a .. ..	Front-Cover-Plate Catch Pin.	
78b .. ..	Front-Cover-Plate-Catch Spring.	
78c .. ..	Front-Cover-Plate-Catch Cap.	
79 .. ..	Magazine Post.	
80 .. ..	Side Plate, R.H.	
81 .. ..	Side-Plate Filling-in Piece, R.H.	
82 .. ..	Side-Plate Side Cam, R.H.	
83 .. ..	Roller.	

# LIST OF PARTS (continued).

Part No. on Arrgt.	NOMENCLATURE	
84	..	.. Roller Collar.
84a	..	.. Roller-Collar Split Pin.
88	..	.. Side Plate, L.H.
89	..	.. Side-Plate Filling-in Piece, L.H.
90	..	.. Side-Plate Side Cam, L.H.
91	..	.. Fuzee-Spring Bracket.
92	..	.. Bottom Plate.
93	..	.. Trunnion Block.
94	..	.. Jacket.
95	..	.. Barrel-Bearing Bush.
96	..	.. Muzzle Attachment.
100	..	.. Hand-Loading Plunger.
101	..	.. Hand-Loading-Plunger Spring.
102	..	.. Hand-Loading-Plunger Piston.
103	..	.. Hand-Loading-Plunger Bell Crank.
104	..	.. Hand-Loading-Plunger-Bell-Crank Axis Pin.
105	..	.. Hand-Loading-Plunger-Bell-Crank-Axis-Pin Nut.
106	..	.. Hand-Loading-Plunger-Bell-Crank Link.
107	..	.. Hand-Loading-Plunger-Bell-Crank-Link Screw.
108	..	.. Hand-Loading-Plunger-Bell-Crank Spring.
109	..	.. Hand-Loading-Plunger-Bell-Crank-Spring Stud.
110	..	.. Hand-Loading-Plunger Trigger.
111	..	.. Hand-Loading-Plunger-Trigger Guide Pin.
112	..	.. Hand-Loading-Plunger Chain Links.
131	..	.. Pin, Actuating Stop Pawl.
132	..	.. Front Guide.
133	..	.. Stop Pawl.
134	..	.. Actuating and Retaining Pawls.
135	..	.. Feed Plate.
136	..	.. Feed Pawl.
137	..	.. Connecting Link.
137a	..	.. Connecting-Link Return Spring.
138	..	.. Brackets, for Actuating and Retaining Pawls.
139	..	.. Spring Pegs.
140	..	.. Pawl Springs.



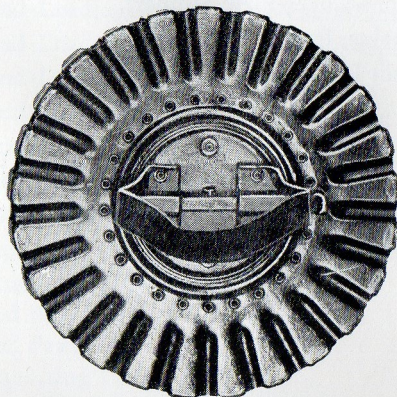
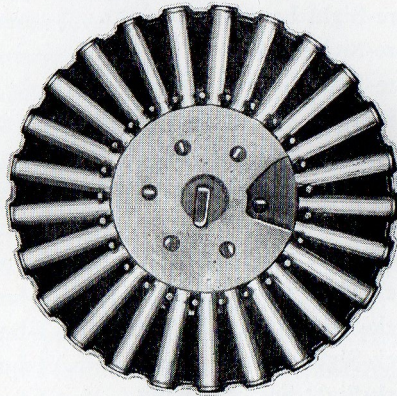
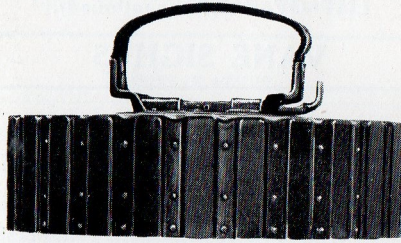
LIST OF PARTS (continued).

VANE SIGHTS

Part No. on Arrgt.	NOMENCLATURE	
141	..	.. Fore-Sight Pillar.
142	..	.. Fore-Sight Bead Post.
143	..	.. Fore-Sight Bead.
144	..	.. Fore-Sight Upper Pivot Arm.
145	..	.. Fore-Sight Lower Pivot Arm.
146	..	.. Fore-Sight Stem.
147	..	.. Fore-Sight Securing Ring.
148	..	.. Fore-Sight Screws for Pivots.
149	..	.. Fore-Sight Wind Vane.
149a	..	.. Fore-Sight Wind-Vane Screws.
150	..	.. Fore-Sight Pivots.
151	..	.. Back-Sight Outer Ring.
152	..	.. Back-Sight Inner Ring.
152a	..	.. Back-Sight Inner-Ring Post.
153	..	.. Back-Sight Stem.
153a	..	.. Back-Sight Securing Ring.
154	..	.. Sight-Stem Securing Screws.
154a	..	.. Front-Cover-Plate Support.
155	..	.. Chains, for securing Sights.
155a	..	.. Split Pins.

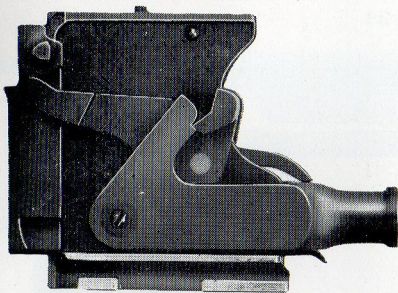
**NOTE.**—When ordering New Parts, the Part Number, Nomenclature and Number of this Handbook must be quoted.



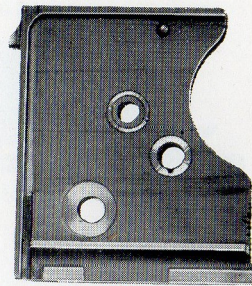


*Plate 1. Three Views of the Magazine.*





ASSEMBLY OF LOCK.



LOCK FRAME.

2 SAFETY SEAR. 3 SPRING.



5  
FIRING PIN.



6  
TUMBLER.



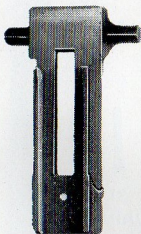
11  
AXIS PIN.



7  
HAND SEAR.



8  
AXIS PIN.



16  
EXTRACTOR.



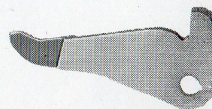
20  
GIB



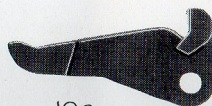
21  
SPRING.



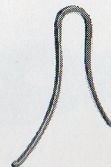
22  
SHUTTER.



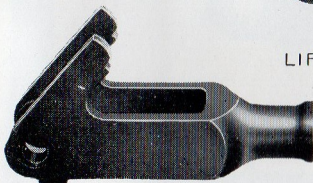
10  
LIFTING LEVER.



10a  
LIFTING LEVER.



9  
MAIN  
SPRING.



13  
SIDE LEVER.



14  
AXIS PIN.

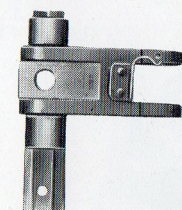
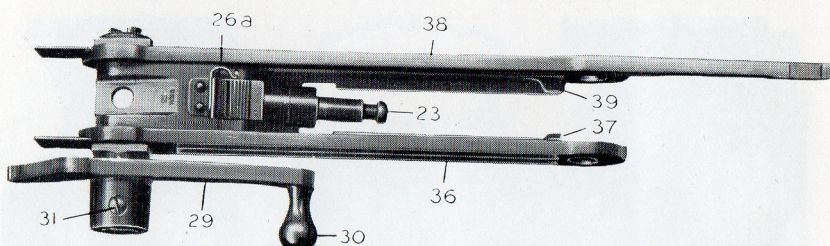


15  
SPRING PIN.

Plate 2. Assembly and Details of the Lock.

Parts arranged in order of assembly.





CRANK.



CONNECTING ROD.



CRANK HANDLE.



ADJUSTING  
WASHER.



CRANK PIN.



ADJUSTING NUT.



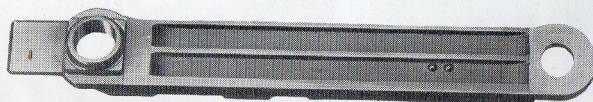
PIN.



SECURING PIN.



RECOIL PLATE L.H.



RECOIL PLATE R.H.

*Plate 3. Assembly and Details of Recoiling Parts.*



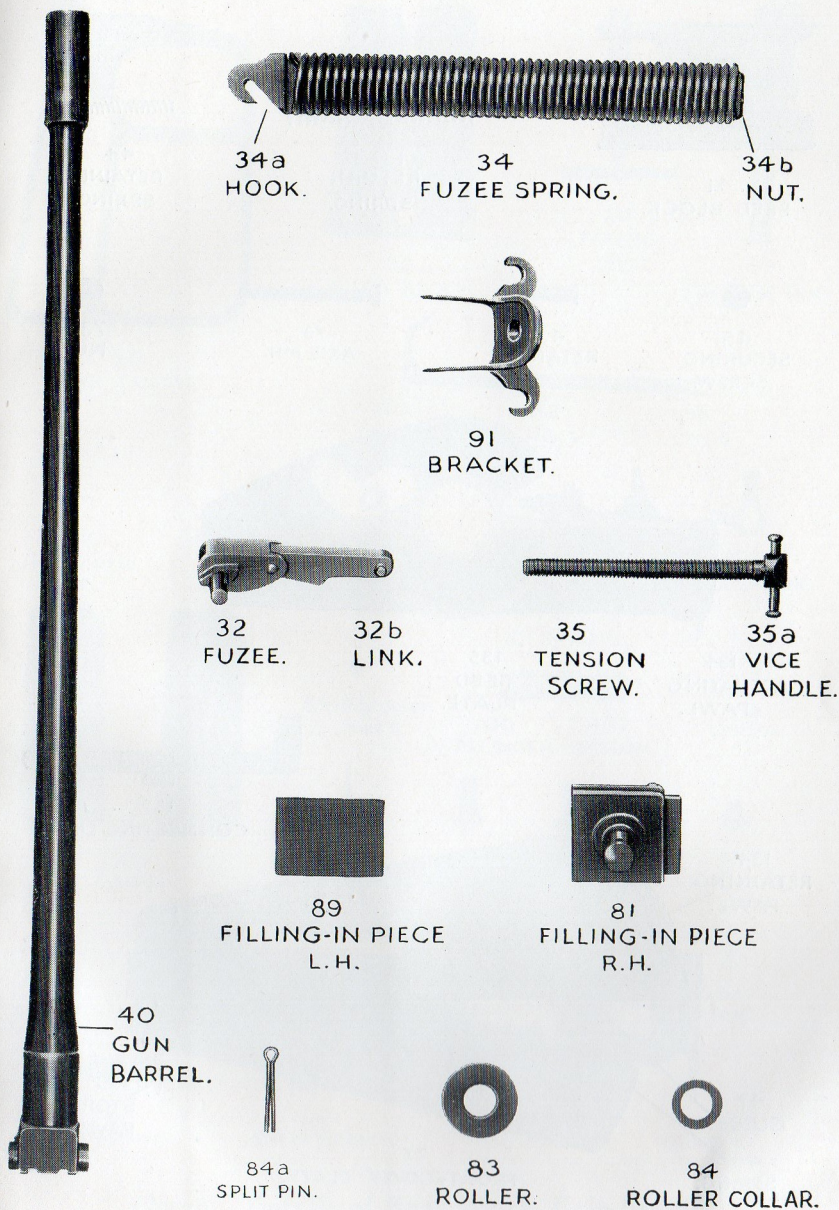
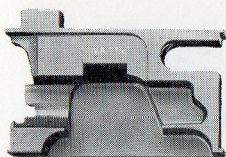


Plate 4. Gun Barrel, Fuze Spring, etc.

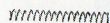




41  
FEED BLOCK.



137a  
RETURN  
SPRING.



44  
RETAINER  
SPRING.



45  
SECURING  
SCREW.



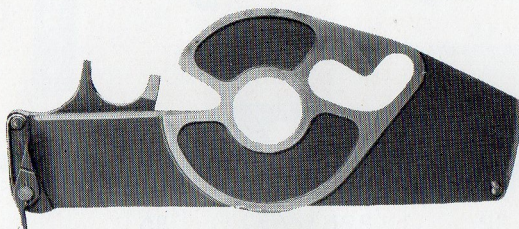
43  
RETAINER.



73  
AXIS PIN



73a  
NUT.



135  
FEED  
PLATE.

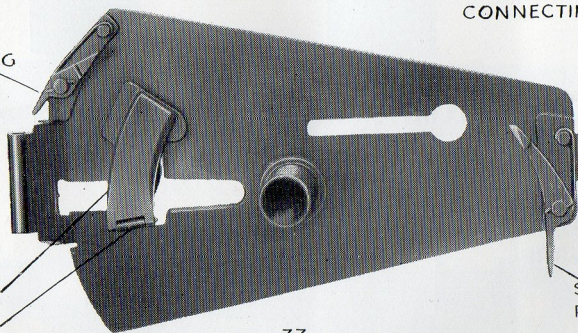


134  
ACTUATING  
PAWL.



137  
CONNECTING LINK.

134  
RETAINING  
PAWL.



77  
FRONT-COVER PLATE.

47  
GUIDE.

48  
SPRING.

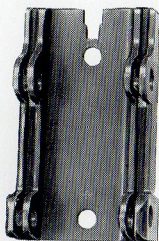
133  
STOP  
PAWL.

Plate 5. Details of Feed Mechanism.

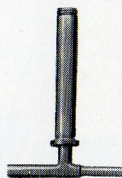




56  
GRIP FRAME.



55  
BACK BLOCK.



58  
FIXING  
PIN.



57a  
NUT.  
57  
HINGE PIN.



110  
TRIGGER.

112  
LINKS.

106  
LINK.



107  
LINK SCREW.



SPLIT  
PIN.



105  
NUT.



104  
AXIS PIN.



103  
BELL CRANK.



56a  
GRIPS.



GRIP SCREW  
NUTS.



101 SPRING.  
100 PLUNGER. 102 PISTON.



108  
SPRING.



56b  
GRIP SCREWS.



62  
BOLTS.



III  
GUIDE PIN.



66  
SPRING.



61  
ACTUATING BAR.



SPLIT  
PIN.



63  
NUTS.



SPLIT  
PIN.



59  
TRIGGER.



64  
SAFETY CATCH.



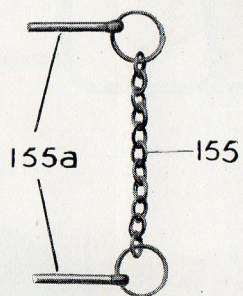
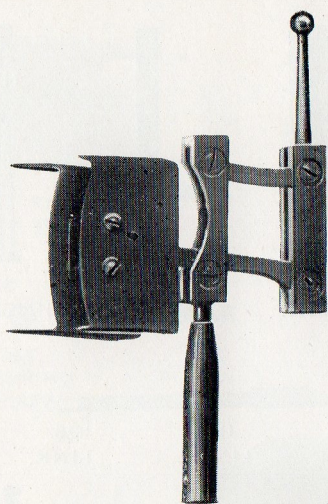
60  
AXIS PIN.



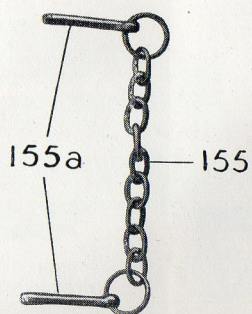
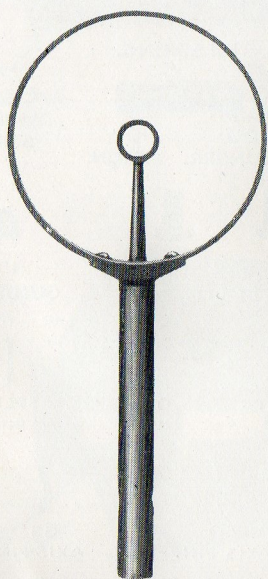
65  
AXIS PIN.

Plate 6. Details of Back Block, Grip Frame  
and Trigger Gear.





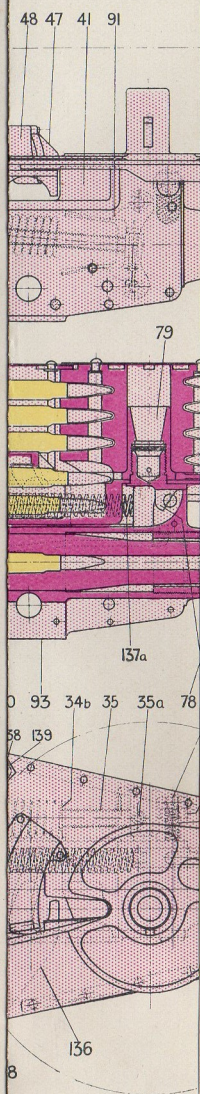
Wind-Vane Fore Sight.



Ring Back Sight.

Plate 7. Fore Sight and Back Sight, etc.





Light Observer's  
General Arrang

Plate 8.  
GENERAL ARRANGEMENT  
OF THE GUN.



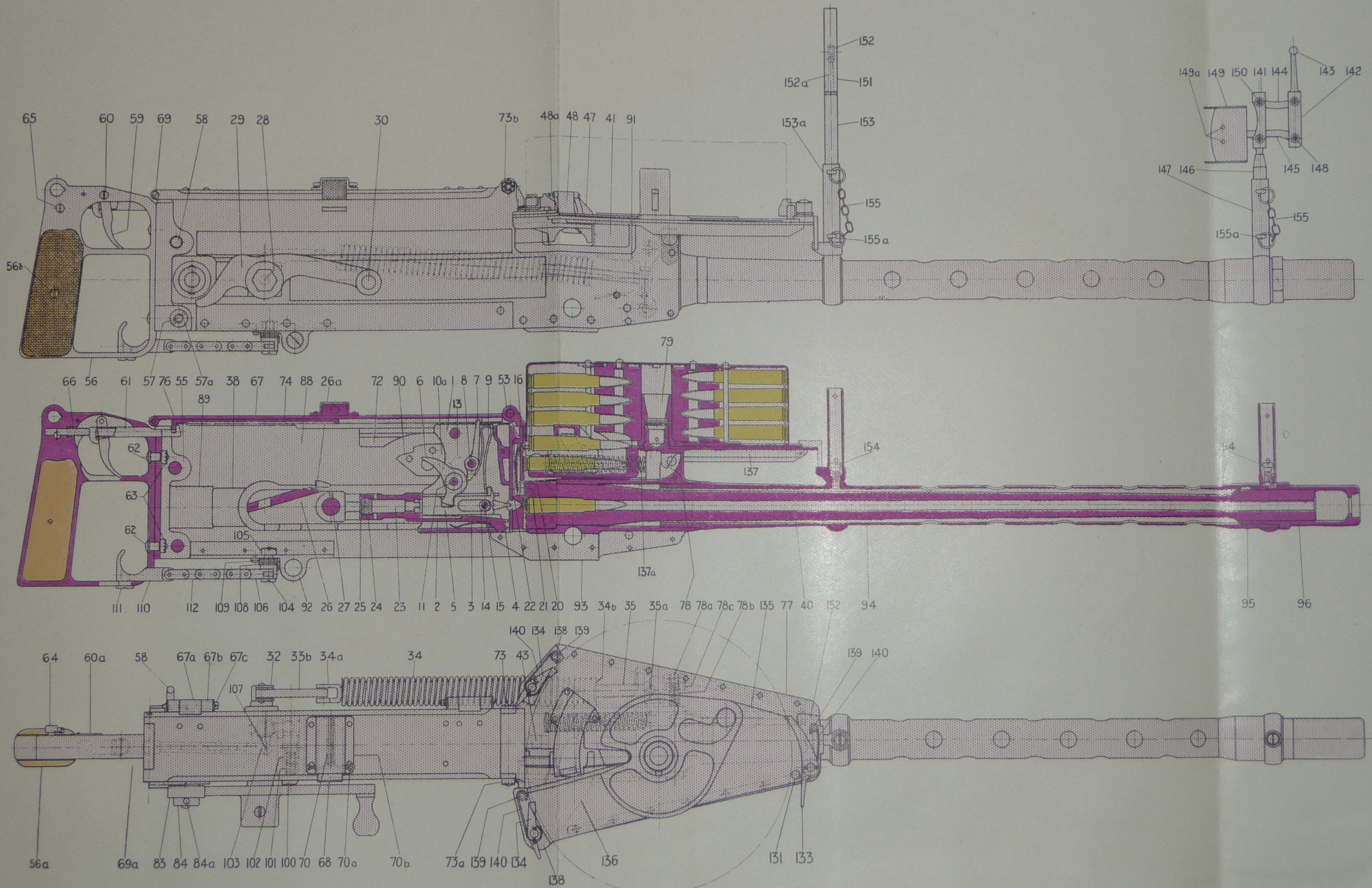
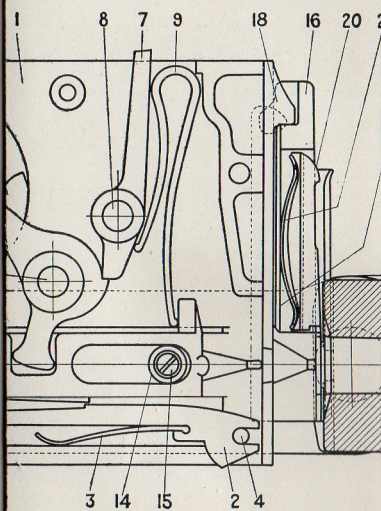
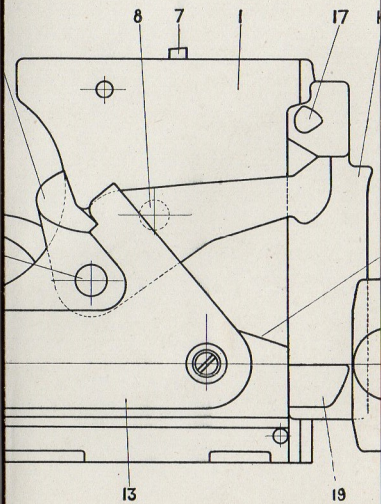


Plate 8. Vickers Aircraft Observer's Machine Gun (Class "F"—Rifle Calibre).





nt of Recoiling Mechanism.

Plate 9  
RECOILING  
MECHANISM



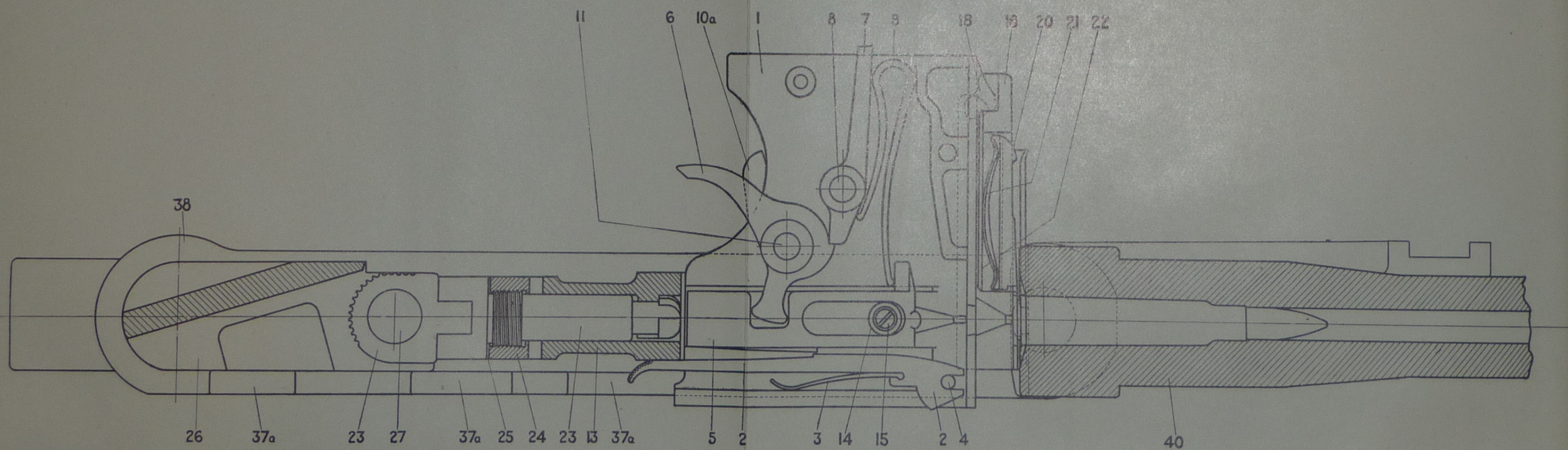
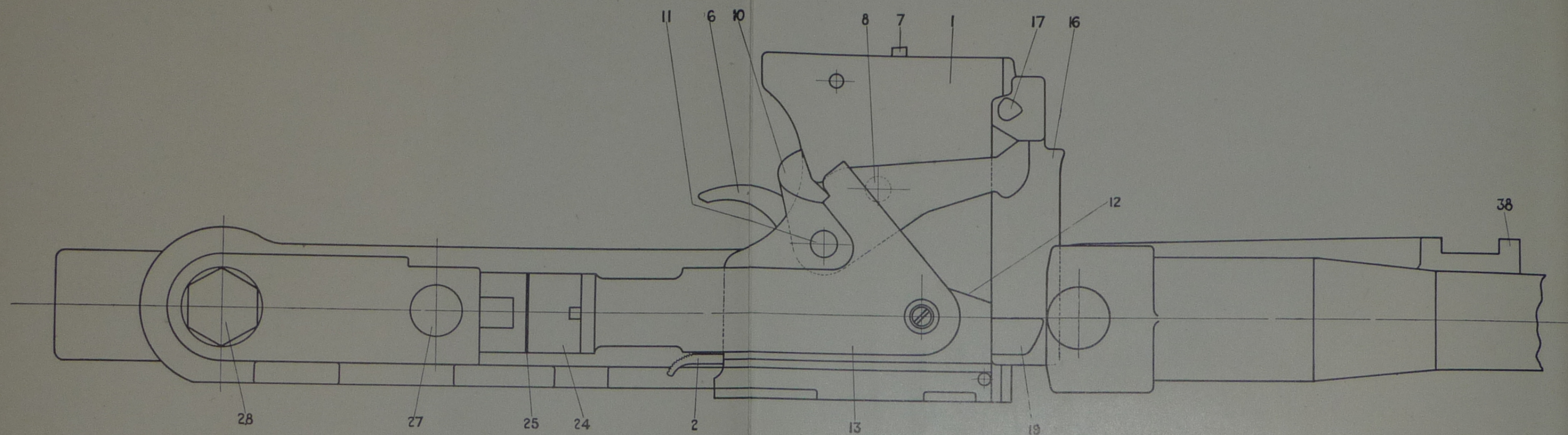


Plate 9.—Arrangement of Recoiling Mechanism.



*Plate 10*  
ACTION OF THE  
MECHANISM

(54)



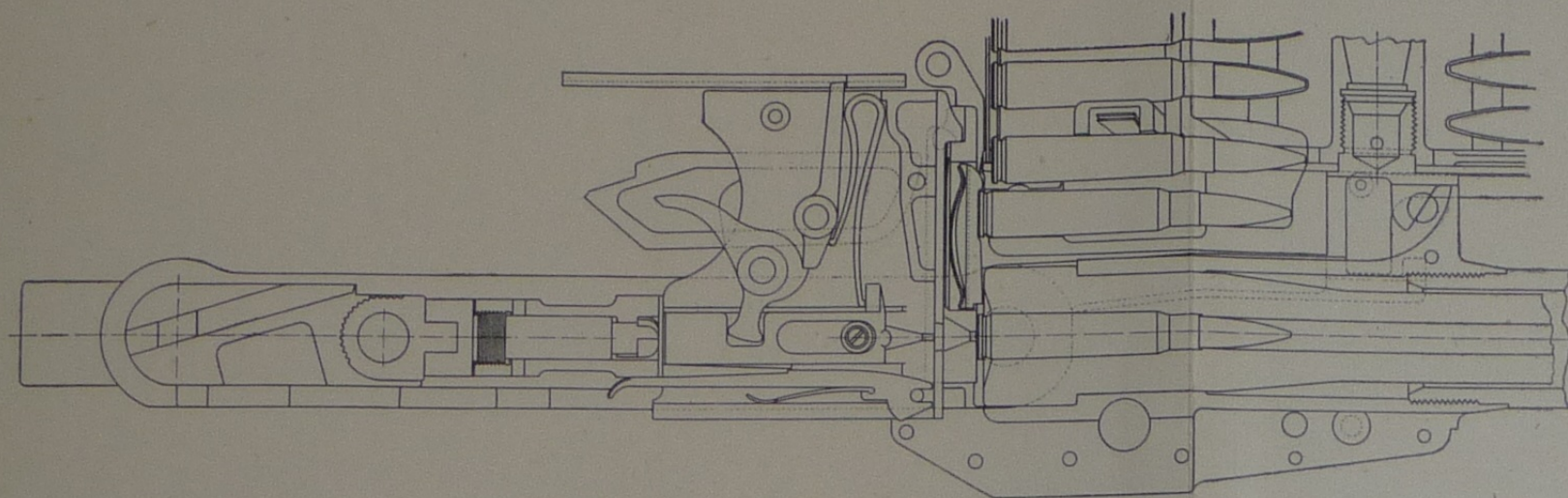


Fig. I. FIRING POSITION.

Lock, Barrel and Recoil Plates, fully home. Firing Pin cocked on to Handsear and Extractor engaging with two live cartridges, one in the Barrel and one in the Feed Block.

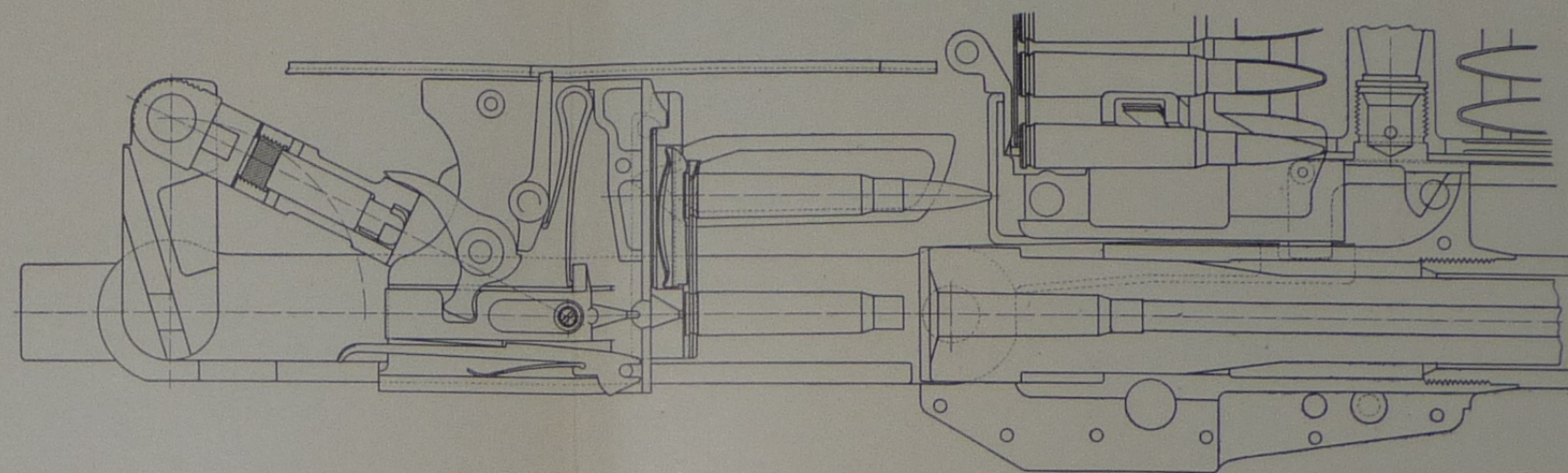


Fig. III. RECOILING POSITION.

Lock partly recoiled, cocking the Firing Pin, extracting the live cartridge from the Feed Block and the empty case from the Barrel. Barrel and Recoil Plates fully recoiled and on the point of returning.

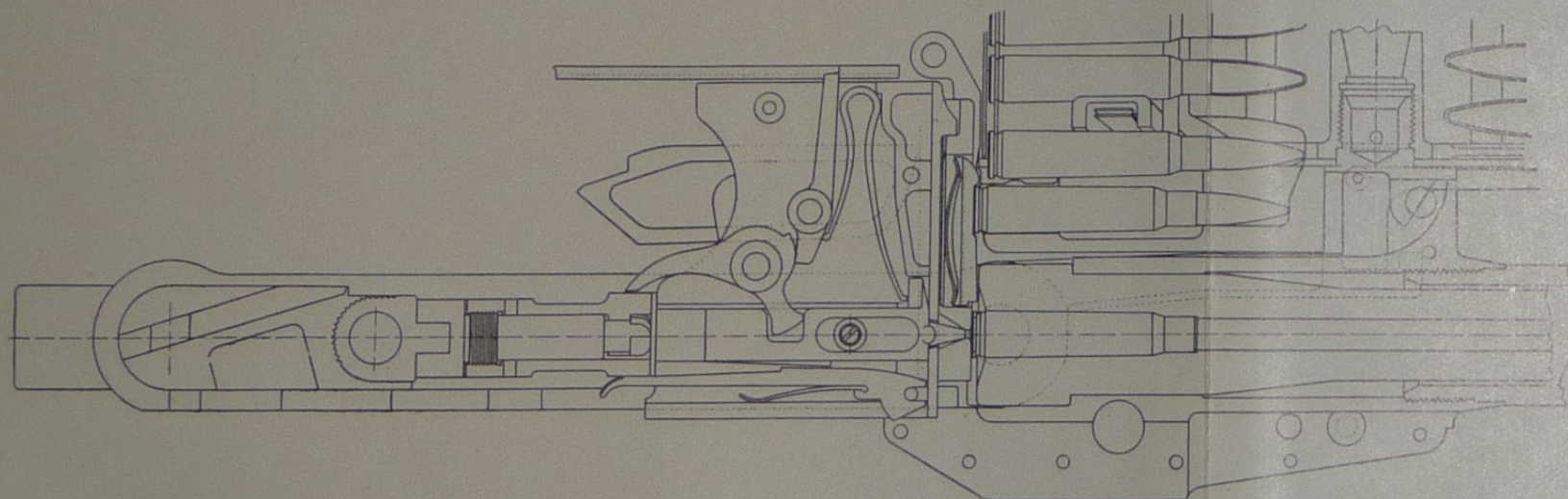


Fig. II. FIRED POSITION.

Lock, Barrel and Recoil Plates fully home. Firing Pin released and the Extractor engaging with a live cartridge in the Feed Block and with the empty case in the Barrel.

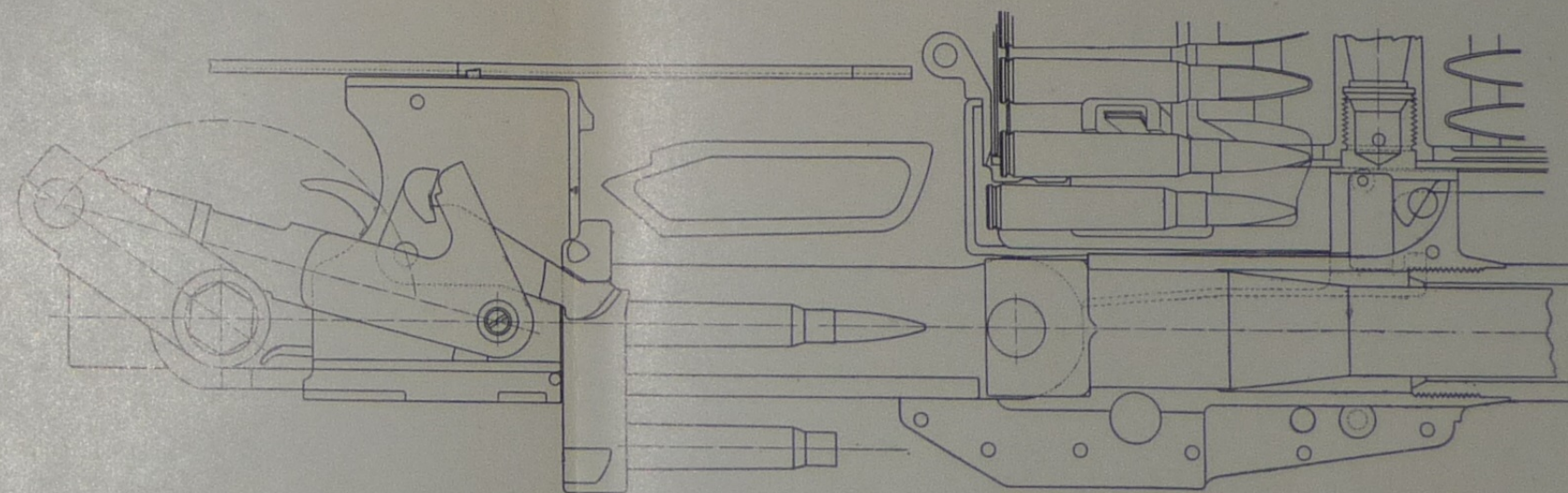
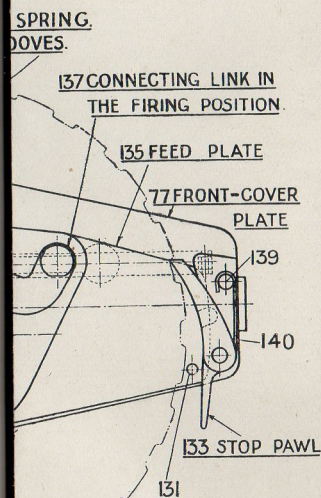
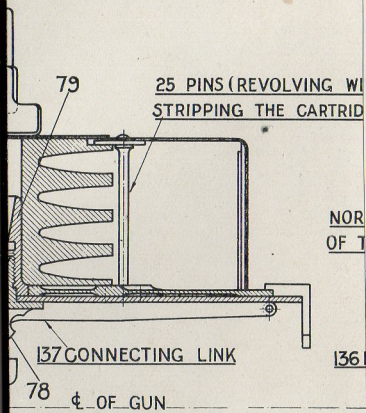


Fig. IV. RETURNING POSITION.

Lock fully recoiled and on the point of returning. Firing Pin cocked on to Safety Sear. Extractor in dropped position bringing live cartridge in line with the chamber of the Barrel. Barrel and Recoil Plates fully returned and new cartridge brought into Feed Block.





FIRING POSITION

Parts of The Feed Mechanism.

Plate 11  
FEED  
MECHANISM

(55)



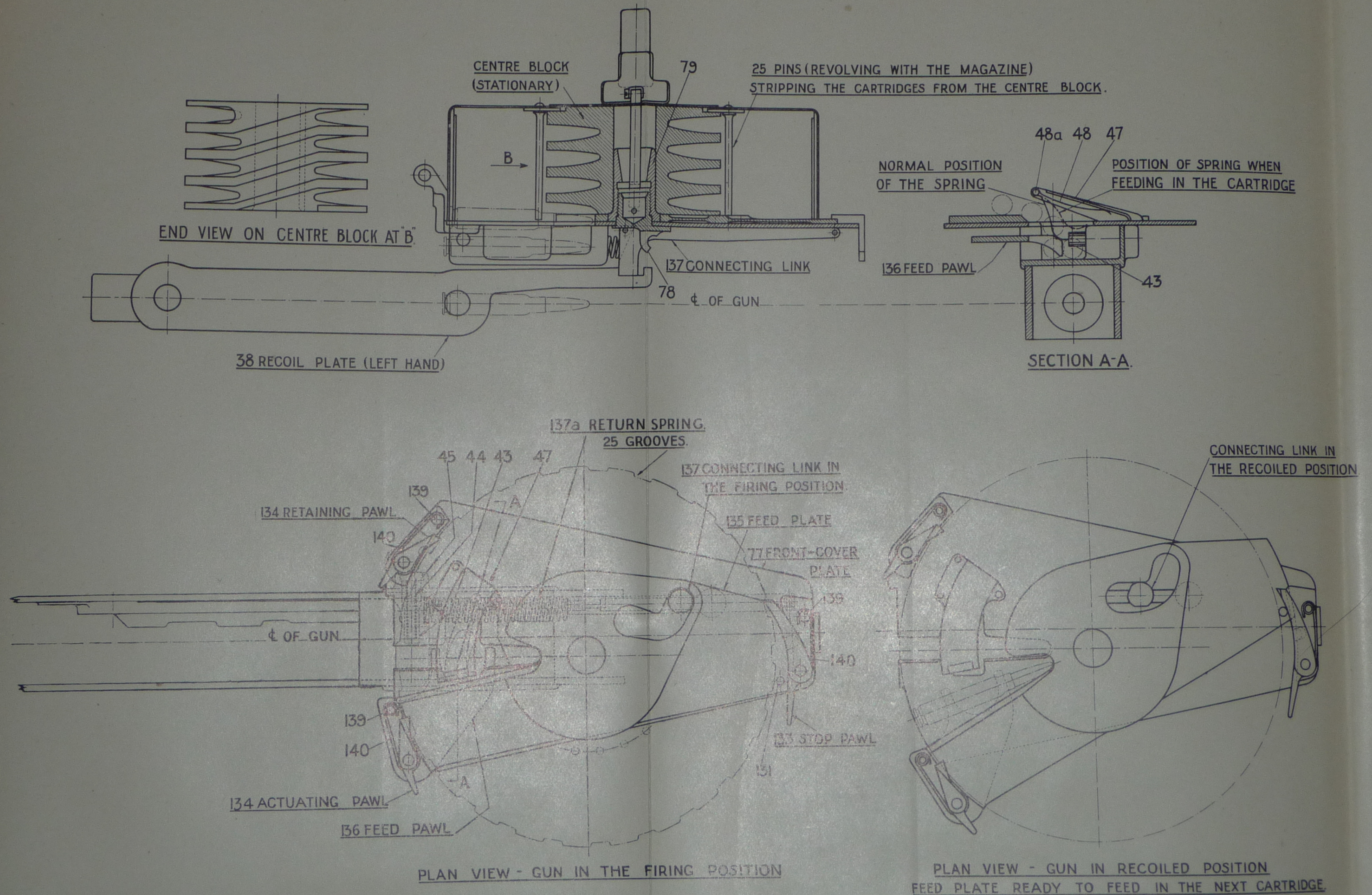


Plate 11.—Diagrams of The Feed Mechanism.





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